Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

BENJAMIN LINCOLN ROBINSON, Editor-in-Chief

MERRITT LYNDON FERNALD
HOLLIS WEBSTER
CARROLL WILLIAM DODGE
} Associate Editors

WILLIAM PENN RICH, Publication Committee

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THE AMERICAN REPRESENTATIVES OF LONICERA CAERULEA.

M. L. Fernald.

During the summer of 1924, on the rocky limestone barrens of northwestern Newfoundland, Messrs. Bayard Long, Boyd Dunbar and I became much interested in an exceedingly pubescent *Lonicera* which, on account of the dense villous-subtomentose pubescence on both surfaces of its leaves, had a gray lustre, in strong contrast with the dull aspect of the common shrub which passes as *L. caerulea,* var. *villosa* (Michx.) T. & G. The leaves, although not strictly velutinous, were almost "velvety" to the touch; and, supposing we had a new member of the subsection *Coeruleae,* we made a special point of collecting it wherever found.

Upon studying the old descriptions, however, it becomes apparent that our shrub has at least twice received specific designations. In fact, it is unquestionably the shrub which Michaux had when he gave the name *Xylosteum villosum*[1]; and we have been mistaken in identifying the much less pubescent shrub of the northern states and adjacent Canada as *Lonicera caerulea,* var. *villosa.* Michaux's brief account was as follows:

> "villosum. X. ramis villosis: foliis oblongo-ovalibus, obtusis, utrinque subtomentoso-villosissimis: pedunculis brevibus; baccis coeruleis.
> *Hab.* in praeruptis saxosis, per tractus montium, a sinu *Hudsonis* ad Canadam. ."

Michaux's descriptive phrase, "foliis . . . utrinque subtomentoso-villosissimis," is certainly more applicable to the shrub of northern Newfoundland than to the ordinary shrub of New England;

[1] Michx., Fl. Bor.-Am. i. 106 (1803).

the habitat, translated freely and in the light of Michaux's collections, as rocky barrens of the mountain region between Hudson Bay and the Saguenay, is one showing many identities in its flora with the barrens of Newfoundland (the unique *Betula Michauxii* Spach., for example), and my own memorandum regarding the Michaux material, made in 1903 but until now not clearly understood, is significant: "most *extremely* pubescent form from 'Lac des Cygnes, Mistassin et Riv. des Goelands'."

Michaux's specific name was soon transferred to *Lonicera* as *L. villosa* (Michx.) R. & S.[1]; and the common shrub of New England which has been generally called *L. caerulea*, var. *villosa* was described as *Xylosteum solonis* Eaton[2] and transferred to *Lonicera* by Sprengel.[3] Material of the latter shrub, being more common in herbaria than the extreme plant of Michaux, the name *L. villosa* was generally and wrongly applied to it; and when DeCandolle studied specimens of the shrub with leaves densely villous-subtomentose on both surfaces, collected by LaPylaie on the Newfoundland barrens, he took it to be a new species, *L. velutina*,[4] described "foliis . . . utrinque ramulisque villoso-tomentosis . . . fructo globoso biumbilicato circa umbilicum ciliato caeterum glabro."

The ciliate "umbilicus," *i. e.*, the ciliate limb of the calyx, emphasized by DeCandolle, is characteristic of the northern plant which must certainly be identified with Michaux's *Xylosteum villosum*. This extreme is likewise characterized by a villous corolla, the more southern extremes having the corolla commonly glabrous. *L. villosa* (Michx.) R. & S., in its typical form, then, is distinguished by leaves densely villous-subtomentose on both surfaces, the young branchlets tomentose and densely pilose, the calyx-limb ciliate at least when young and the corolla villous. This extreme, most typical from northwestern Newfoundland to Lake Mistassini, extends locally southward to Maine and northern New Hampshire.

Southward *L. villosa* is chiefly represented by four well marked variations with somewhat different geographic limits: the shrub described as *L. Solonis* (Eaton) Sprengel, with new branchlets both puberulent and pilose-hirsute (the pilosity sparse as compared with that of typical *L. villosa*), the leaves pilose beneath and strigose to

[1] Roem. & Schultes, Syst. v. 256 (1819).
[2] Eaton, Man. 26 (1817), ed. 2, 498 (1818).
[3] Sprengel, Syst. i. 759 (1825).
[4] DC. Prodr. iv. 337 (1830).

glabrate above, the calyx-limb not ciliate, the corolla ordinarily glabrous, a variety ranging from southern Newfoundland to southeastern Manitoba, south to Connecticut, Michigan, Wisconsin and Minnesota; *L. caerulea*, var. *calvescens* Fernald & Wiegand,[1] with the young branchlets pilose-puberulent but not hirsute and the leaves finely pilose beneath or glabrate, ranging from eastern Labrador southward through Newfoundland and the Maritime Provinces and locally to Ontario and Connecticut, in New England chiefly in alpine and subalpine districts; the most southern variety, with the surfaces of the young branchlets glabrous (not puberulent) and the leaves sparingly pilose to glabrous, ranging from southeastern Maine to southern Ontario, and south to northeastern Pennsylvania; and a singular variety discovered by the late T. O. Fuller and several times collected in Norfolk County, Massachusetts, a shrub with glabrous branchlets and with the corolla-tubes slender and practically lacking the gibbosity at base which characterizes the other varieties. In the West, from the Yellowstone Park to the Pacific and south to the Yosemite region occurs a thin-leaved shrub with red berries and other characters which seem to set it off as a species. Ever since the union of the American shrubs with the Eurasian *L. caerulea* L. by Hooker[2] in 1834, they have generally passed as that species or, if distinguished at all, they have been treated indiscriminately as *L. caerulea*, var. *villosa* (Michx.) T. & G. In 1910 the first departure from this conception occurred when *L. caerulea*, var. *calvescens* was set off.

Lonicera caerulea of Eurasia is a shrub with widely divergent branches; winter buds spreading or divergent, often with accessory buds, corolla pilose, with the lobes distinctly shorter than the tube, and essentially uniform, the corolla thus being practically regular; filaments attached 2–3 mm. below the sinuses of the corolla; the very glaucous fruits with purple juice (formerly used as a dye) and usually disagreeable bitter taste; seeds brown, elliptic to obovate, 2–3.3 mm. long; leaves of the sprout-shoots frequently bearing large stipular appendages.

The European shrub is most beautifully illustrated in all details, in *Flora Danica*, Suppl. t. 131 and its habit and essentially regular corollas are well shown also in the *Botanical Magazine*, xlv. t. 1965, in Jacquin's *Florae Austriacae*, v. t. 17, and in Reichenbach's *Icones Florae Germanicae et Helveticae*, xvii. t. 1575.

[1] Rhodora, xii. 210 (1910).
[2] Hook., Fl. Bor.-Am. i. 283 (1834).

Lonicera villosa, the shrub of northeastern North America which has so long passed as *L. caerulea,* differs from the wide-ranging Eurasian species in many characters. Its branches are strongly ascending; winter buds appressed or ascending, usually without accessory buds; corolla (glabrous or pilose) with the lobes equaling or exceeding the tube, slightly bilabiate; filaments attached only slightly (up to 1 mm.) below the sinuses; the blue or blue-black fruits with or without a slight bloom, with pale watery juice and sweet and edible pulp; seeds whitish- or pale-brown, short-oblong or suborbicular, 1.2–2 mm. long; stipules unknown.

Lonicera "caerulea" is usually given an American range including the whole region from Labrador to Alaska and British Columbia, southward into the northern states. So far as representation in the Gray Herbarium and the herbarium of the Arnold Arboretum indicate, however, the eastern species, *L. villosa,* reaches its western limit in eastern Manitoba and Minnesota; while the western species occurs from Washington south to the Yosemite region and east only to western Wyoming. No material of the group has been seen from British Columbia and Alaska, though Henry[1] cites *L. "caerulea"* from South Kootenay Pass. In all published descriptions the western shrub is said to have blue or blue-black fruit; but, singularly enough, no specimens are at hand indicating that the authors of these statements have collected mature fruit. From immature fruit, of course, the color cannot be determined, but the four sheets at hand with "dead ripe" fruits at once show a peculiar reddish tone quite unlike that seen in the fruits of either *L. caerulea* or *L. villosa,* and Cusick definitely states on the label of his no. 2662, "A shrub 3–5 feet. Pale red fruit." This red-fruited shrub of western America has the branching, the ascending winter buds, the high insertion of the filaments and the seeds as in *L. villosa,* but its leaves are membranaceous and not rugose (those of *L. villosa* coriaceous and rugose), and in anthesis the calyces have elongate and strongly ciliate lobes (*L. villosa* with lobes practically undeveloped).

Although the great bulk of the Eurasian shrubs are clearly referable to *Lonicera caerulea,* the slight representation at hand from Japan shows that *L. venulosa* Maxim. has the branching, winter buds and deep-cleft corolla of the two American species; and drawings made by Mr. Alfred Rehder of dissected corollas of this species show

[1] J. K. Henry, Fl. So. Brit. Columb. 279 (1915).

the filaments inserted practically at the sinuses. Similarly Mr. Rehder's drawings indicate that other Japanese shrubs belong with the American rather than the continental Eurasian shrub. Such Japanese material as I have been able to examine, however, is quite distinct in one or another character from any of the forms known in North America.

The variations of *Lonicera villosa* are indicated in the following key and synopsis.

a. Leaves densely villous-subtomentose on both surfaces: branchlets tomentose or densely short-pilose beneath long pilosity: limb of calyx ciliate at least in anthesis: corolla villous or pilose . . . . Var. *typica.*

a. Leaves pilose-hirsute to glabrous beneath, strigose to glabrous above: branchlets with puberulent or glabrous surfaces, or rather sparsely pilose-hirsute: limb of calyx glabrous: corolla glabrous (rarely pilose) *b.*

b. Base of corolla-tube strongly gibbous on one side *c.*

c. Surfaces of young branchlets puberulent *d.*

d. Young branchlets puberulent and more or less pilose-hirsute: leaves pilose beneath, strigose to glabrate above . . . . Var. *Solonis.*

d. Young branchlets merely puberulent: leaves finely pilose to glabrate beneath . . . . Var. *calvescens.*

c. Surfaces of young branchlets glabrous: leaves sparingly pilose to glabrous . . . . Var. *tonsa.*

b. Base of corolla-tube slender and almost regularly tapering, scarcely gibbous on either side: young branchlets glabrous . . . . Var. *Fulleri.*

L. VILLOSA, var. **typica.** *Xylosteum villosum* Michx. Fl. Bor.-Am. i. 106 (1803). *L. villosa* Roem. & Schultes, Syst. Veg. v. 256, (1819).[1] *L. velutina* DC. Prodr. iv. 337 (1830). *L. caerulea,* var. *villosa* (Michx.) T. & G. Fl. N. Am. ii. 9 (1841).—Straits of Belle Isle to Lake Mistassini, south to Maine and northern New Hampshire. The following are referred here. LABRADOR: rocks, Forteau, July 30, 1910, *Fernald & Wiegand,* no. 4053. NEWFOUNDLAND: trailing on peaty and turfy slopes, limestone barrens, Sandy (or Poverty) Cove, Straits of Belle Isle, August 1, 1924, *Fernald, Long & Dunbar,* no. 27,104; barrens, Flower Cove, July 12, 1921, *Mary E. Priest;* prostrate on turfy and peaty knolls in limestone barrens, Flower Cove, August 1, 1924, *Fernald, Long & Dunbar,* no. 27,103; prostrate on peaty and turfy knolls or slopes on limestone barrens, Brig Bay, August 6, 1924, *Fernald, Long & Dunbar,* no. 27,105; wet runs and boggy spots in limestone barrens, near sea-level, Ingornachoix Bay, August 4, 1910, *Fernald & Wiegand,* no. 4055; prostrate in damp peaty hollows in gravelly limestone barrens, Sandy Cove, Ingornachoix Bay, August 9, 1924, *Fernald, Long & Dunbar,* no. 27,106; Torbay,

[1] The name *L. villosa* was published in Muhl. Cat. 23 (1813) but only by inference is it associable with Michaux's plant. Roemer & Schultes leave no doubt, since they copy Michaux's description.

August 21–26, 1901, *Howe & Lang*, no. 1406. Quebec: grassy shore, Romaine, Lagorgendière, September, 1915, *St. John*, no. 90,738; *in praeruptis saxosis*, "Lac des Cygnes, Mistassin et Riv. des Goelands," August and September, 1792,[1] *Michaux* (types at Mus. Hist. Nat. Paris). Maine: rocky pasture, Orono, July 2, 1890, *Fernald;* Town Hill, Mt. Desert Island, June 15, 1890, *Rand;* Monmouth, August, 1896, *E. D. Merrill.* New Hampshire: Tuckerman's Ravine, June 26, 1901, *Pease*, no. 1253; bog, Carroll, July 13, 1910, *Pease*, no. 12,713; Hanover, May 23, 1915, *Mrs. E. D. Haskins.*

Var. **Solonis** (Eaton), n. comb. *Xylosteum solonis* Eaton,[2] Man. 26 (1817), ed. 2: 498 (1818). *L. solonis* (Eaton) Spreng. Syst. Veg. i. 759 (1825). *L. caerulea*, in large part, of Am. auth., not *L. villosa* of early Am. authors, and *L. caerulea*, var. *villosa* of most recent Am. authors, not *Xylosteum villosum* Michx.—Southern Newfoundland to southeastern Manitoba, south to Massachusetts, northern Rhode Island, Connecticut, Michigan, Wisconsin and Minnesota. The following selected from many specimens, are typical. Newfoundland: open bogs among the hills, Grand Falls, July, 1911, *Fernald & Wiegand*, nos. 6250, 6251; boggy ditch between Mt. Musgrave and Humber Mouth, July 15, 1910, *Fernald & Wiegand*, no. 4052. Quebec: arbor-vitae swamp, Goose Lake, New Richmond, July 16 and 17, 1905, *Williams, Collins & Fernald;* swamp, Dudswell, July 23, 1923, *Knowlton.* Prince Edward Island: wet thicket, Selkirk, July 7, 1914, *Fernald & St. John*, no. 11,186. Nova Scotia: mountains north of Barrasois River, Cape Breton, July 28, 1914, *Nichols*, no. 428; swampy woods and thickets, Springhill Junction, July 18, 1920, *Pease & Long*, no. 22,604; boggy thicket, Yarmouth, July 3, 1920, *Bissell & Long*, no. 22,603. Maine: Caribou bog, Crystal, June 24, 1898, *Fernald*, no. 2643; sphagnous bog, Orson Island, Oldtown, July 27, 1916, *Fernald & Long*, no. 14,591; southwest wall of North Basin, Mt. Katahdin, July 14, 1900, *Fernald;* dry rocks, Pembroke, July 6, 1909, *Fernald*, no. 2149; sand-plain, Columbia, August 4, 1916, *Knowlton;* damp woods, Mackerel Cove, Swans Island, July 7, 1914, *Hill*, no. 1477; Fayette, 1894, *Kate Furbish;* Tacoma, Litchfield, May, 1897, *J. M. H. Morrell;* swamp, Leeds, July 23, 1915, *Knowlton.* New Hampshire: roadside, Cambridge, August 15, 1915, *Pease*, no. 16,534; bog, Success, August 27, 1907, *Pease*, no. 10,640; bog, Crawford, July 15, 1895, *Williams;* low open ground, Whitefield,

[1] "Le 22 Aoust sur la Riv. Mistassin, . . . Lonicera camae-cerasus fol. tomentos . . . Le 29 . . . Nous arrivames au Lac des Cygnes . . . Le 4 Septemb. . . . A 10^h 1–4 entré dans le Lac Mistassin . . . Le 5 fait environ 8 à 10 lieues et diné sur la rive des Goelands à 16 lieues de distance du Lac"—Journ. André Michaux, ed. Sargent. Proc. Am. Phil. Soc. xxvi. no. 129: 77–81 (1888).

[2] The name *Solonis* needs some explanation. In his 1st edition Eaton said: "Found on the White Mountains (N. H.) by Dr. D. Solon. C. H. Smith"; but in the 2d he spoke of it as "Found first by Dr. Solon Smith (1815) at the foot of Whitehills." Drs. A. S. Pease and F. Tuckerman call my attention to the fact that the three names of the discoverer of the plant are pure synonyms and are all reducible to David Solon Chase Hall Smith, M.D. (Yale, 1816).

July 3, 1896, *Deane;* Chocorua, 1896, *Mrs. E. L. Bolles;* granite gravel and peaty slopes, alpine region of Mt. Lafayette, Franconia, August 10 and 11, 1915, *Fernald,* no. 11,878; swamp, Londonderry, August 15, 1921, *Knowlton;* Winchester, May 12, 1877, *W. F. Flint.* VERMONT: Brunswick, August, 1890, *Eggleston,* no. 1260; Concord, May 29 and 30, 1903, *Eggleston,* no. 3307. MASSACHUSETTS: South Framingham, May 12, 1890, *E. L. Sturtevant;* swamp, Sharon, May 19, 1907, *Knowlton;* low, open ground, Norfolk, June 24, 1911, *Ware;* bog, Medfield, May 21, 1916, *Hunnewell,* no. 4087; Harvard Forest, Petersham, May 30, 1914, *J. Murdock, Jr.;* Savoy, May 31, 1901, *Hoffmann;* low woods, Pittsfield, May 30, 1919, *Churchill, Knowlton & Schneider;* Washington, July 15, 1909, *Hoffmann.* RHODE ISLAND: low, open ground, Cumberland, *Hunt et al.* CONNECTICUT: border of Great Cedar Swamp, Voluntown, June 17, 1899, *Graves;* swamp, Killingly, July 2, 1903, *Knowlton;* rocky pasture, Stafford, June 12, 1906, *Bissell.* ONTARIO: swampy places, Nipigon, June 24, 1884, *Macoun.* MICHIGAN: bog, Isle Royale, September 2, 1910, *Cooper,* no. 307. WISCONSIN: swamps, Milwaukee, *Lapham.* MANITOBA: Winnipeg Valley, *Bourgeau.*

Rehder, in his *Synopsis of the Genus Lonicera,* 73 (1903) cites in the synonymy of the aggregate *L. caerulea,* var. *villosa,* "*L. coerulea Canadensis* 'Lamarck'." This name was originally published as follows: "LONICERA CAERULEA *canadensis* Lam. (*Xylosteum Solonis* Eat.)"—Delamare, Renauld & Cardot, Ann. Soc. Bot. Lyon, xv. 85 (1887), reprinted as Flor. Miquelon, 21 (1888). Lamarck, however, had no properly published var. *canadensis.* Under *L. caerulea* he had besides the typical European shrub a second: "*β, Eadem foliis ovato-subcordatis, petiolis dilatis plerumque connato-perfoliatis.* N. *An xylosteum Canadense.* Duham. Arb. 2. p. 373." And in the fuller description of var. *β* Lamarck again emphasized the *connate* leaves: "La variété β, que l'on cultive au Jardin du Roi, & qu'on nous a dit originaire de Canada, a ses feuilles plus larges, ovales presqu'en coeur, glabres, . . . dilatés à leur insertion, souvent même connés & comme perfoliés."—Lam. Encycl. Meth. Bot. i. 731 (1783).

So far as *L. caerulea canadensis* "Lam." is concerned, even if we admit the publication of the name by inference, it can have nothing to do with *L. villosa,* the connate-perfoliate leaves clearly placing it in the subgenus *Periclymenum!* *Xylosteon canadense* Duhamel, cited by Lamarck, and after him by DeCandolle and others, was not published as a binomial, but was simply the first half of a polynomial: "XYLOSTEON *Canadense foliis latioribus,* XYLOSTEON de Canada

à feuilles larges"—Duham. Traité des Arbres et Arbustes, ii. 373 (1755); it has no nomenclatorial status.

As already stated the fruits of *L. villosa* are edible, usually as good as blueberries (*Vaccinium* § *Cyanococcus*). In sending a specimen of var. *Solonis* to Asa Gray, the late I. A. Lapham added to the label: "Is not this worth cultivating for its abundant fine flavored fruit? I will send you a root"; in the *Catalogue of the Flowering Plants and Ferns of Connecticut* we find: "The berries are edible, resembling the blueberry in flavor"; and in their account of Washington County, Maine, Fernald & Wiegand say: "During our stay at Pembroke we were introduced to several food-plants which were new to our experience. The first of these was the 'Waterberry,' *Lonicera caerulea* L., var. *villosa* (Michx.) T. & G., which we enjoyed in some abundance for three weeks before the ripening of the Blueberries, which Waterberries resemble both in appearance and taste"—Rhodora, xii. 109 (1910).

Var. **calvescens** (Fernald & Wiegand), n. comb. *L. caerulea*, var. *calvescens* Fernald & Wiegand, Rhodora, xii. 210 (1910), in great part, including type.—Eastern Labrador (lat. 56°) to Ontario and Connecticut, often in alpine and subalpine regions. Since the two varieties following have been segregated from var. *calvescens* as originally published, it is desirable to cite some characteristic specimens. Labrador: Makkovik, August, 1896, *A. Stecker*, no. 39; Indian Harbor, Hamilton Inlet, August 2, 1891, *Bowdoin College Exped.;* on the gneiss plain, Blanc Sablon, August 1, 1910, *Fernald & Wiegand*, no. 4054. Newfoundland: limy bog-barrens, Mistaken Cove, Straits of Belle Isle, August 1, 1924, *Fernald, Long & Dunbar*, no. 27,102; Fogo Island, July 1, 1906, *Owen Bryant;* moor, Whitbourne, August 16, 1894, *Robinson & Schrenk*, no. 11; swale at margin of Goose Pond, July 9, 1910, *Fernald & Wiegand*, no. 4051 (type); border of boggy meadow, near Frenchman's Cove, Bay of Islands, July 19, 1921, *Mackenzie & Griscom*, no. 10,448. Quebec: edge of woods, Iles Boisées de Cap Blanc, Washtawouka, Goynish, July 5, 1915, *St. John*, no. 90,739; Seven Islands, August 3, 1907, *C. B. Robinson*, no. 688 (distributed as *Vaccinium ovalifolium*); marais, Coin-du-Banc, Percé, Juillet 25, 1923, *Marie-Victorin et al*, no. 17,843; subalpine meadows at 1200 m., Mt. Au Clair, Tabletop Mts., August 10, 1923, *Fernald & Smith*, no. 26,026; alpine bogs, tableland of Mt. Albert, July 21–23, 1906, *Fernald & Collins*, no. 726; alpine and subalpine meadows, at about 1075 m., southeast of Pease Basin, between Mts. Logan and Pembroke, July 13, 1923, *Fernald, Griscom & Mackenzie*, no. 26,025; Rivière-du-Loup, August, 1914, *Victorin*, no. 528. Magdalen Islands: border of larch swamp, Grindstone, July 17, 1912, *Fernald, Bartram, Long & St. John*, no. 8074; wet

thicket, Amherst Island, August 25, 1914, *St. John*, no. 1997. Nova Scotia: boggy margin of pond, mountains bordering St. Ann's Bay, Cape Breton, July 21, 1914, *Nichols*, no. 238; thickets, Shubenacadie Grand Lake, July 27, 1921, *Fernald, Bartram & Long*, no. 24,532. New Brunswick: South Tobique Lakes, July 18, 1900, *Hay*, no. 39. Maine: shelves at 4000–4500 ft., west wall of North Basin, Mt. Katahdin, July 13, 1900, *Fernald;* sphagnous bog, Moore's Harbor, Isle au Haut, July 27, 1914, *Hill*, no. 1685; South Poland, 1895, *Kate Furbish.* New Hampshire: Alpine Garden, Mt. Washington, July 3, 1900, *T. O. Fuller et al;* Oakes Gulf, Mt. Washington, *Faxon et al;* northwest slope of Mt. Washington, June 22, 1908, *Pease*, no. 11,183; above headwall of Tuckerman's Ravine, August 28, 1907, *Pease*, no. 10,729; foot of cone of Mt. Monroe, June 22, 1908, *Pease*, no. 11,214. Massachusetts: swamp, Sharon, June 23, 1911, *Blake*, no. 1550; cedar swamp, Walpole, June 28, 1908, *Ware*, no. 2290; Blackstone, May 21, 1916, *Knowlton, Bean & Schweinfurth*, no. 16,189; Pelham, May 16, 1915, *Floyd.* Connecticut: meadow, Eastford, July 18, 1917, *Weatherby*, no. D1713. Ontario: bog, Silver Islet Beach, August 4, 1912, *C. S. Williamson*, no. 2070.

The Massachusetts and Connecticut material sometimes has a few long trichomes on the young tips, thus showing transition to var. *Solonis.*

Var. **tonsa**, n. var., a var. *calvescente* recedit ramis novellis glabris rare sparseque hirsutis nec puberulis.—*L. caerulea*, var. *calvescens* Fernald & Wiegand, l. c. (1910), in part.—Southeastern Maine to southern Ontario, and south to northeastern Pennsylvania. Maine: O'Connell's Point, North Lubec, September 8, 1902, *Kate Furbish;* moist thickets, Herrick's Bay, Brooklin, August 6, 1918, *Hill*, no. 2973; alder swamp, Matinicus, June 21, 1919, *C. A. E. Long;* Greenvale, 1894, *Kate Furbish.* New Hampshire: wet shore, Second Lake, Pittsburg, July 3, 1907, *Pease*, no. 10,176; swale, Colebrook, July 19, 1917, *Fernald & Pease*, no. 16,563; wet meadow, Stratford Hollow, June 9, 1912, *Pease*, no. 13,470; bogs, Jefferson, June 18, 1908, *Pease*, no. 11,263; ditch, Randolph, June 18, 1908, *Pease*, no. 11,246; granitic gravel and peaty slopes, alpine and subalpine region of Mt. Lafayette, Franconia, July 17 and 18, 1915, *Fernald & Smiley*, no. 11,877; sphagnum bog, Jaffrey, August 29, 1898, *Robinson*, no. 598, May 28, 1899, *Rand & Robinson*, no. 867. Vermont: Scorpioides bog, Willoughby, June 9, 1895, *Kennedy* (form with unusually developed bracts). Massachusetts: Dedham, May 14, 1886, *Dame;* sphagnous swamp, Walpole, June 7, 1896, *Williams;* sphagnous swamp, Sharon, June 17, 1896, *Williams;* Castilleia swamp, Franklin, June 17, 1897, *S. Harris;* damp roadside, Athol to Petersham, May 12, 1912, *Fernald, Hunnewell & Wiegand;* low ground, Cold Brook Springs, Oakham, May 12, 1912, *Fernald, Hunnewell & Wiegand* (type in herb. N. E. Bot. Cl.); Breakneck Brook Valley, Southbridge, May 20, 1916,

Churchill & Woodward; swamp, Sturbridge, May 20, 1916, *Knowlton.* Rhode Island: swampy meadow, North Smithfield, May 30, 1900, *Chamberlain & Collins,* no. 129. Connecticut: hummocks in wet meadow, Tolland, May 4, 1913, *Weatherby,* no. 2906. Ontario: Mer Bleue, near Ottawa, June 1, 1905, *Macoun,* no. 66,467; Wingham, June 28, 1891, *J. A. Morton.* New York: marsh near Newcomb, Essex Co., at 1700 ft., June 8, 1921, *House,* no. 8014. Pennsylvania: vicinity of Naomi Pines, Pocono Mts., Monroe Co., June 7–10, 1889, *Small.*

Var. **Fulleri,** n. var., a var. *calvescente* recedit ramis novellis glabris nec puberulis; foliis glabratis; corollae tubo gracili vix basi gibbo aut aequali; baccis elongatis.—Massachusetts: Rosemary Meadow, Needham, May 13 and June 19, 1887, *T. Otis Fuller* (types in herb. N. E. Bot. Cl.), May 6, 1894, *Fuller.*

A remarkable shrub, in its glabrous branchlets and glabrate foliage quite like var. *tonsa,* which is the commonest variety in Norfolk County; but with corollas so unlike those of the other varieties of *L. villosa* that, considered alone, they would at once suggest that the Needham shrub is a distinct species. It is a great pleasure permanently to associate with it the name of its discoverer, Timothy Otis Fuller (1845–1916), for many years one of the keenest and most scholarly amateur naturalists of New England, whose herbarium, presented by Mrs. Fuller to the New England Botanical Club, is a storehouse of unusual and discriminating notes and of beautiful analytical drawings.

The shrub of the West, which has there passed as *L. villosa,* may be called

L. **cauriana,** n. sp., caule erecto 0.8–1.5 m. alto, ramulis valde adscendentibus glabris vel pruinosis vel puberulis plerumque sparse hirsutis; foliis membranaceis anguste obovatis vel oblongis 2–9 cm. longis 1–4 cm. latis margine et subtus ad nervos villoso-ciliatis; pedunculis folio valde brevioribus; bracteis lineari-setaceis ovario duplo longioribus; calycis limbo juvenili plus minusve lobato ciliato; corollis flavescentibus pilosis basi gibbis ad mediam lobatis subbilabiatis; baccis rubris; seminibus albido-brunneis orbicularibus vel ellipticis 1–1.7 mm. longis; gemmis axillaribus adpressis vel valde adscendentibus.

Erect shrub 0.8–1.5 m. high; branches strongly ascending, glabrous, pruinose or puberulent and commonly sparsely hirsute: leaves membranaceous, narrowly obovate or oblong, 2–9 cm. long, 1–4 cm. wide; the margins and nerves beneath villous-ciliate; peduncles much shorter than the leaves; bracts linear-setaceous, twice as long as the ovary; young limb of the calyx more or less lobed, ciliate; the lobes less obvious in age: corolla yellowish, pilose, gibbous at base, lobed to the

middle, somewhat bilabiate: berries red: seeds whitish-brown, orbicular or elliptic, 1–1.7 mm. long: axillary buds appresed or strongly ascending.—Wyoming to Washington and California. WYOMING: Yellowstone Park, 1873, *Parry*, no. 197; abundant in boggy ground on the creek bottom, Obsidian Creek, Yellowstone Park, July 24, 1899, *A. & E. Nelson*, no. 6096; Norris Geyser Basin, Yellowstone Park, September 7, 1904, *J. G. Jack*. IDAHO: Musselshell Creek, Bitter Root Mts., July 16, 1902, *C. V. Piper*, no. 4107; at edge of brook, alt. 6400 ft., Cape Horn, Custer Co., August 6, 1916, *Macbride & Payson*, no. 3649. NEVADA: Franktown, Washoe Co., alt. 5000 ft., June 28, 1909, *A. A. Heller*, no. 10,389. CALIFORNIA: Westfall's Meadows, Yosemite Valley, *Bolander*, no. 6338; by Tuolumne River, Tuolumne Meadows, alt. 8600 ft., July 19, 1907, *R. A. Ware*, no. 2625C; near Soda Springs on Tuolumne River, August 19, 1907, *Alice Eastwood*, no. 496; Lassen Peak, July, 1879, *Mrs. R. M. Austin*. OREGON: Upper Des Chutes River, *Newberry;* west end of Paulina Lake, alt. 2100 m., July 29, 1894, *Leiberg*, no. 577; dry gravelly soil of Squaw Creek, Crook Co., July 16, 1901, *Cusick*, no. 2662; bank of Big Springs Creek, along Fort Klamath-Bend road, July 19, 1920, *M. E. Peck*, no. 9574. WASHINGTON: low wet ground, Mt. Paddo (Adams), August 10, 1882, *Suksdorf*, no. 134; alpine meadows, Mt. Paddo (Adams), June 29 and August, 1885, *Suksdorf*, no. 559 (TYPE in Gray Herb.); Skamania Co., July 25, 1886, *Suksdorf*. Presumably also in British Columbia.

Differing from *L. villosa* in its membranous and scarcely rugose leaves, well-developed calyx-limb (in anthesis), and small red berries; from *L. caerulea* in its appressed or ascending winter buds, strongly ascending branches, more deeply cleft and more bilabiate corolla, red berries without bloom and small mostly orbicular pale seeds.

GRAY HERBARIUM.

THE VARIETIES OF CORALLORRHIZA MACULATA.

H. H. BARTLETT.

MR. H. MOUSLEY of Montreal, Quebec, has sent me water-color sketches of three Corallorrhizas with the request that I identify them. I can hardly do so without bringing up the question of whether or not *Corallorrhiza maculata* var. *intermedia* Farwell is really identical with var. *fusca* Bartlett. I confess that I overlooked Mr. Farwell's publication[1] of var. *intermedia* when I wrote the note[2] on

[1] O. A. Farwell, New species and varieties from Michigan. Ann. Rep. Mich. Acad. Sci. **19:** 247–249. 1917.

[2] H. H. Bartlett, Color types of Corallorrhiza maculata Raf. RHODORA **24:** 145–148. 1922.

which he has commented,[1] so if the names are not synonyms (and I believe they are not) it must be attributed to good fortune rather than good management.

Mr. Mousley sends three water-color sketches painted by Mr. R. Holmes of Toronto. One of them illustrates var. *flavida* (Peck) Cockerell very beautifully, from specimens found by the artist himself in a wood a few miles northeast of Toronto. It appears to differ from Michigan specimens in the slightly spotted rather than uniformly white lip. The distinction, although perhaps too slight for nomenclatorial recognition, indicates that there are genetically different forms within var. *flavida*.

The other two paintings represent plants collected by Mr. Mousley himself at Hatley, Quebec, in July 1924. One of them represents what I should identify as var. *punicea*. Mousley's notes as to color read "The lips of this form were only spotted along the lamellae, thus forming two lines, as it were, with two little spots on each lateral lobe. Petals and sepals not spotted at all; column slightly so at the base. Tips of sepals and petals very slightly brownish." There are here two deviations from my description of var. *punicea*, namely (1) that in the Quebec specimens spots are lacking except on the lip, whereas in the Michigan material the flower parts were all spotted, and (2) that the flower parts were slightly brown at the tip in the Quebec specimens but not in those from Michigan. As to the first distinction, it indicates again the existence of forms of each variety differing among themselves as to the abundance and distribution of spots. The second distinction is less significant, since slight browning at the tips of sepals and petals might not improbably come about through injury or incipient drying, under which circumstances it would be quite different from the normal brown of var. *fusca*.

The third painting is the one that calls for this note. It seems to depict a plant really intermediate in coloration between var. *punicea* and var. *flavida*, and therefore conforming to the original description of Farwell's var. *intermedia*, which reads as follows: "Whole plant purplish yellow; lip white with two or three large, very pale purplish spots; no spots on the other petals or sepals. Copper Harbor, Keweenaw Peninsula, no. 4003, July 8, 1915. Exactly intermediate between the species and the var. *flavida* (Peck) Cockrl.

[1] O. A. Farwell, Corallorrhiza maculata Raf. RHODORA **25**: 31–32. 1923.

in color and in spots, which are found only on the lip and are fewer, larger, and paler than in the species. The species is common; and the var. *flavida* also is found at Copper Harbor, no. 4002, July 8, 1915." After matching carefully the sheath color of var. *fusca* with Van Dyke brown (as represented in Ridgeway's "Color Standards"), I can hardly think that any one having this plant in hand would describe it as exactly intermediate between var. *punicea* ("the species" as Mr. Farwell calls it) and var. *flavida*. I stated in my former note that *Corallorrhiza maculata* "probably contains still other varieties." This statement was made with plants in mind (but not at hand) that might fall into var. *intermedia* Farwell. My description of three definite varieties was not intended to provide a name for every specimen that might be collected. I am inclined to believe that Mr. Mousley's second Hatley (Quebec) type should be referred to var. *intermedia* Farwell.

Again, however, a discrepancy in the matter of spotting is to be noted. Farwell's var. *intermedia* had spots "only on the lip and fewer, larger, and paler than in the species." Mr. Mousley's note on his plant is "The lips of this form are spotted all over, also the petals, sepals and column." Var. *fusca* had the whole flower spotted. In throwing the species into varieties according to general plant color the maculation of the flower has to be neglected. The genetic factors for the distribution of spotting are doubtless a different series from those responsible for what Emerson has termed plant color in the study of maize. If it were desired to name all of the genetic entities in *Corallorrhiza maculata* two courses would be open to the systematist. He might assign a formal name to each combination of characters, thus making a multitude of forms, or he might classify into varieties on some one group of characteristics (as, for example, plant color), and neglect others (as, for example, spotting of the flower). The latter policy leaves it open to later botanists to enumerate, describe and name the forms if they wish, either ranging them under the varieties or neglecting the more comprehensive varieties entirely.

American taxonomy is impatient of numerous minute distinctions within a species, and it is necessary to turn to Europe for an elaborately studied parallel to our Corallorrhiza situation. Mainly on the basis of color and color pattern, Wittrock[1] recognized 140 named

[1] V. B. Wittrock, Linnaea borealis L. species polymorpha et polychroma. Acta Horti Bergiani 4, No. 7: 1–187. 13 plates. 1907.

forms of *Linnaea borealis* in Sweden, ranged, according to the more basic color distinctions, in four groups, which he named the Poliochromae, Mesochromae, Xanthochromae, and Erythrochromae. Obviously, the four groups might equally well have been called subspecies or varieties, as, indeed, the International rules would require, since the provision is made in Article 28 that the names of subdivisions of species be in the singular. To bring Wittrock's nomenclature into conformity with general usage it would merely be necessary to supplant his plural group names by the four varietal names, each variety comprehending a group of forms. The varietal names would satisfy those botanists who are appalled by the extreme degree of splitting which Wittrock's work shows to be possible and necessary if our systematic botany is to interpret nature in every detail, but who are not averse to giving nomenclatorial recognition to the more conspicuous genetic types within a species. Applying the parallel to Corallorrhiza, it may be supposed that many botanists would note the chief plant color types, but would disregard forms based upon the spotting of the flower. The forms exist, however, and may sometime attract a student. Unless an elaborate treatment, involving the recognition of many forms, is desired, the varieties must be based upon general plant color to the neglect of more minute characteristics.

As a result of this unfortunately lengthy note upon so slight a matter it is hoped that orchid students will not hurriedly admit the identity of *Corallorrhiza maculata* var. *intermedia* with var. *fusca.*

University of Michigan, Ann Arbor, Michigan.

Gaura parviflora Dougl., var. **lachnocarpa,** n. var., a forma typica differt hypanthio fructuque pubescentibus.—United States. Alabama: weed, up to six ft. tall, in vacant lots near railroad, Montgomery, June 9, 1924, *R. M. Harper.* Missouri: Dry soil, Courtney, Sept. 20, 1915, *Bush,* no. 7738. Texas: meadows, Tarrant Co., Aug. 29, 1912, *Ruth,* no. 283; roadside, Austin, May 8, 1918, *M. S. Young,* no. 95 (type); Kerrville, Kerr Co., May 14–21, 1894, *Heller,* no. 1768; dry banks, Austin, May 12, 1872, *E. Hall,* no. 216; in campis, San Fernando de Bexar, Junio, 1828, *Berlandier,* no. 2052; without definite locality, *Lindheimer,* no. 241. New Mexico: near Mesilla, May 11, 1897, *A. A. Crozier.* Arizona: sandy river bank, Tempe, April 21, 1892, *Ganong & Blaschka;* Beaver Creek, Sept. 20, 1922, *W. W. Jones,* no. 69; Ft. Mojave, 1860–61, *J. G. Cooper.* Mexico.

COAHUILA: Saltillo, April, 1880, *E. Palmer*, no. 2119. SONORA: May, 1851, *Thurber*, no. 365. BAJA CALIFORNIA: San Jose del Cabo, March-June, 1897, *Anthony*, no. 330; margins of ditches, Maleje, June, 1887, *E. Palmer*, no. 11.

This variety has no distinctive character except its pubescent hypanthium and fruit, but, as indicated by the specimens cited above (all in the Gray Herbarium), it has a distinctive range. Typical *G. parviflora* ranges from Washington and Oregon to South Dakota and Illinois and southward to Utah, Arizona, Sonora and Texas. All of the collections seen from north of Texas and Alabama have strictly glabrous fruit, with the exception of Bush's no. 7738 from Missouri, cited above, and a transitional specimen from Denver, Col. (Aug. 11, 1910, *Eastwood*, no. 31), which has glabrous and sparingly pubescent fruit in the same spike.

Morphologically, the relation of var. *lachnocarpa* to the typical form is analogous to that of *Gaura induta* Wooton & Standley to *G. glabra* Lehm., or that of *Oxybaphus glaber*, var. *recedens* to typical *O. glaber*.—C. A. WEATHERBY, Gray Herbarium.

SHRUBS OF INDIANA.[1]—Mr. Charles C. Deam's work here mentioned is unusual in several respects. Shrubs, as a category, are rarely treated apart from the trees of the region in which they occur. The justification of such a treatment rests, of course, on its convenient limitation of numbers rather than upon any more natural taxonomic basis. As the same author in this instance has already published an excellent work on the trees of his state, his present publication forms an appropriate companion volume.

In this work there are included 143 species and many varieties. The keys are frankly artificial, but their alternatives appear to be clear and well chosen. The illustrations are full-page plates and represent all the species treated. They are from pressed specimens, reproduced in exceptionally good half-tones. This type of illustration is rarely satisfying, but Mr. Deam's unusual skill in the selection and preparation of his specimens, combined with manifest care on the part of the photographer, the half-tone artist and the pressman, has resulted in a series of reproductions possessing an excellence which leaves little to be desired. Habital and foliar characters are surprisingly brought out. Even the "gesture" of the plants is preserved better than could have been anticipated from pressed material.

[1] Charles C. Deam, Shrubs of Indiana. Publication no. 44 of the Indiana Department of Conservation. 351 pages, 148 plates. Imperial 8vo. Indianapolis, December, 1924.

The limited number of species treated permits fuller description, more detailed statement of range and more copious comment on habit and uses than are usually found in floristic works.

Mr. Deam's well known diligence in the exploration of his state, in which he has traveled over 50,000 miles for botanical purposes, gives his work a high degree of completeness. It will be found a useful volume of reference far beyond the limits of Indiana.

The treatment of the genus *Salix* was contributed by Mr. Carleton R. Ball, the well known willow-specialist of the Department of Agriculture.

The scientific nomenclature is that of the International Rules. Vernacular names, actually in use, are given, but the perpetuation or manufacture of artificial "common names" is wisely avoided.—B.L.R.

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Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. February, 1925. No. 314.

EDWARD LOTHROP RAND.[1]

B. L. Robinson.

(With portrait.)

A recreative interest in science brings its devotee into many new relations. It enriches life, diversifies activities, develops unsuspected faculties, and is apt greatly to extend personal acquaintance. The direction of such a hobby may be decided by some special opportunity, by environment, or even by accident; but its development will be individual and determined by personality. Some persons are attracted by concrete facts and become primarily observers. Others get pleasure in records and are moved to set down descriptive memoranda regarding objects and phenomena. On the other hand there are those who find facts interesting only as they can be correlated, interpreted, and made the basis of theory or generalization. Even more frequently the amateur possesses the instinct of acquisition, forms collections and tends to immerse himself in the preparation, mounting, labelling and classification of specimens. Some revel in field-work, exploration, and out-of-door observation. Others derive much of their pleasure from the literature of their chosen subject; they build up libraries bearing upon it, and become discriminating in the matter of editions and critical of publications. Finally, there is a far more human approach to science, namely the impulse which leads its possessor into cordial relations with his fellow workers and which stirs his interest in their traits as well as their activities. Those gifted with this type of interest have an important function. They are exceedingly helpful to science. It is they who form clubs

[1] A memorial address delivered before the New England Botanical Club Feb. 6, 1925.

and associations. It is they who correspond widely. It is they who are apt to be keen about the history of their subject and help much in its record and preservation. They cheer and encourage and through them much that would otherwise be dry routine and detail becomes humanly attractive because viewed as the work of human beings with individual characteristics and the peculiarities of distinct personality. Very notable in this valuable phase of scientific interest was our late secretary.

He was, it is true, himself an acute observer. He was an indefatigable collector. He was also critical in the acquisition and interpretation of scientific literature; but his keenest interest, at least in the last twenty-five years of his life, was in the human side of science.

Edward Lothrop Rand was born in Dedham, Massachusetts, August 22, 1859, the son of Edward Sprague and Jennie Augusta (Lathrop) Rand. After preparation at the Hopkinson School in Boston, he entered Harvard College in 1877. His first serious efforts to acquire a knowledge of plants appear to have taken place in the summer of 1880 during the vacation between his junior and senior years. Of this summer he was able to spend a part on Mt. Desert Island in exceptionally stimulating companionship and under conditions well nigh ideal.

He was one of a group of Harvard students who camped on Somes Sound. They were much alive to the joys of woodcraft, of boating, fishing, of mountain-tramping, and were keen to perfect themselves in the technique of sailing and of camping. Mt. Desert forty-five years ago seemed much more remote than it does today. Its summer population was relatively sparse. There were still considerable tracts of land sufficiently wild to stimulate the spirit of adventure and exploration. This group of young men formed themselves into an association which they called the Champlain Society, after Samuel de Champlain, the voyager who discovered and named Mt. Desert.

The organization seems at no time to have been very large. It included some twenty, perhaps twenty-five members, but owing to the scattered periods of their outings and limited camping equipment it was rare for more than ten or a dozen to be in camp at any one time. It is clear that these young men were there primarily for recreation and were wholesomely successful in getting it, but they seem early to have grasped the idea that the pleasures of a summer outing can be much increased by an intermingling of serious purposes.

They were fresh from their college studies and they determined to accomplish a creditable amount of field work in various natural sciences. These were discussed and volunteers were called for to undertake special interests. Among the subjects selected were ornithology, botany, entomology, geology and meteorology.

Among the members of this Champlain Society were Charles and Samuel A. Eliot, sons of President Eliot of Harvard University, who was himself at that period a summer resident of Northeast Harbor. Other members were Benjamin Bates, Henry W. Bliss, Walter L. Burrage, William H. and G. B. Dunbar, Morris Earle, John McGaw Foster, Robert W. Greenleaf, Henry Champion Jones, William Coolidge Lane, Ernest Lovering, John Prentiss, Edward Lothrop and Henry L. Rand, Henry M. Spelman, Roland Thaxter, John L. and Julius Wakefield, William L. Worcester, and Robert Worthington. As these names have been derived chiefly from the botanical records it is probable that the list is by no means complete.

Few enthusiasms are more keenly pleasurable than those of observant persons who set themselves the task of discovering and recording the flora or fauna of a region new to their acquaintance. Every member of our own Club must at times have experienced this joy as on some summer outing he has attempted to list in a locality new to him all the trees, all the ferns, orchids, mosses or possibly all the flowering plants. To anyone who has enjoyed this particular zest it will be easy to understand the enthusiasm of this group of young men as they entered upon their exploration of the diversified and picturesque island of Mt. Desert.

Happily, they kept, at least regarding their botanical activities, admirable records from the outset. The work of each year from 1880 to 1888 was made the subject of a formidable quarto brochure written out in long hand. These reports form human documents of no small interest.

They show ample evidence of boyish exuberance. They are decorated with sketches of camp or yacht ensigns, and are embellished with poems. The first list of plants covered those observed and identified in 1880. It dealt almost exclusively with the larger-flowered phanerogams and a few of the more readily recognized ferns. Even the trees were not attempted to any great extent, and the grasses and sedges were frankly omitted. The entire number of species was but 170. The nomenclature is that of the then current

fifth edition of Gray's Manual. Authorities were not thought needful and many of the names are those which have long passed into the limbo of synonymy, though some of them, such as *Thalictrum Cornuti*, *Anemone nemorosa* and *Nabalus alba* will still linger in the recollections of the older members of our Club.

This first list appears to have been drawn up by Mr. W. H. Dunbar, though much of the report was contributed by Mr. Rand and it was he who prepared the chief matter of all the succeeding botanical reports. The second already shows marked improvement, though still diffident and amateurish. The number of plants was increased to 372. There was greater care. Authorities are appended to all the scientific names. Ten grasses and six sedges are included, and a special list of trees and shrubs is added, together with a very solemn essay on the value of forests and the importance of their conservation.

The Champlain Society sometimes held meetings in the winter. These were under the leadership of Charles Eliot and chiefly at his rooms. It was doubtless on these occasions that the reports were read. At these meetings attention was also given to the history and traditions of Mt. Desert, a subject in which Mr. Charles Eliot was particularly interested.

About this time Mr. Rand spent parts of three or four summers at a fishing camp on Lake Molechunkamunk with his classmates John W. Suter and Ernest Lovering. These trips to the Rangeley Lake region probably continued from 1878 to 1881. The camp was situated just below Upper Dam and from this centre the young men made many excursions in different directions. From Mr. Rand's notes it seems clear that the chief botanical work undertaken by them in this region was accomplished in September 1880, in which Mt. Aziscoos was climbed and some 160 species were listed, of which, on account of lateness in the season, many had to be identified from fruiting specimens.

Some spring trips to Mt. Desert were made by Messrs. Rand and Lane to ascertain and collect the early-flowered plants.

In the third botanical report, covering work done in 1882, the so-called "grand total" was brought up to 440. From this time on it is clear that progress was becoming more difficult. The plants of easy access and ready identification had been largely listed. Additions had to be sought among rarer species and in groups of greater technicality.

In the fourth report the number of species was advanced to 492, including 53 grasses, sedges and rushes listed by Robert Greenleaf and a small beginning in the record of the mosses by Walter L. Burrage.

This may be regarded as the culminating achievement of the Champlain Society. No such group of young men, however congenial, could hold together during the strenuous period when they were just entering their professions or getting a start in serious business activities. It was no longer possible for them to arrange coincident vacations. Fewer and fewer could get to the camp even for a short outing, and those who did had lost something of their earlier enthusiasm.

We find the report for 1884 a bit mournful and such frank expressions as the following creep in: "as far as scientific work was concerned the expedition was an absolute failure. Nobody did any work except Messrs. Wakefield, Burrage and Rand of the Botanical Department, and their work was not very successful." One member proclaimed that he "would do no work during his vacation" and is stated to have remained "most faithful to his resolution."

Nevertheless, the reports were continued up to 1888 though they drop considerably in volume and the additions to that closely watched "grand total" become fewer and fewer.

However, as his associates in the Champlain Society gradually dispersed, Mr. Rand had the great good fortune to meet with a most admirable collaborator in Mr. John Howard Redfield of Philadelphia, an accomplished botanist, also a summer resident of Mt. Desert, who had himself been observing, collecting and recording its plants. Mr. Redfield, already elderly, generously placed his data at the service of the younger man and was able to give him much encouragement and aid. He was a man of scientific experience and a personal friend of Dr. Asa Gray. He had wide acquaintance among botanical specialists and it was probably through his influence that the later reports entered a new phase in the work, namely that of verification. This was accomplished by the reference of material to specialists. The sedges and Rubi were sent to Prof. L. H. Bailey. The name of Prof. F. Lamson Scribner appears in connection with the grass identifications. Prof. T. C. Porter helped about the asters and golden-rods. Mr. M. S. Bebb was deferred to about the willows, and Mr. G. E. Davenport regarding the ferns. Dr. T. F. Allen named the Characeae and Dr. Morong verified the pondweeds. Dr. N. L.

Britton was consulted and gave aid, Mr. F. S. Collins identified some marine algae. The hepatics were named by Prof. L. M. Underwood, some of the mosses by Prof. C. R. Barnes and others by Mrs. Britton; while the Sphagna were sent to Mr. Edwin Faxon and by him referred to Dr. Carl Warnstorf. Dr. J. W. Eckfeldt and Miss Clara E. Cummings furnished information about the lichens, and Mr. Walter Deane was consulted and his aid is stated to have been invaluable.

The collections of previous years were re-examined and disclosed unsuspected species of a technical nature. In 1888 the whole work was summarized and recorded in a manifolded catalogue which was given a certain publication by its distribution to the collaborators and to several botanical establishments and libraries. The purpose of this preliminary publication was to give a convenient checking list for further work. In the years 1889 to 1891 four supplements to this list were similarly manifolded and distributed.

In 1894, after repeated revisions, much emendation, and most conscientious proof-reading, Rand and Redfield's Flora of Mt. Desert appeared. For its epoch it was an exceptionally excellent local flora, the result of fourteen years of earnest endeavor and well-knit co-operation. It may be placed in the same class as Dame and Collins's Flora of Middlesex County and the scholarly Cayuga Flora of W. R. Dudley. Exceedingly few American floras have attempted the treatment of the thallophytes and bryophytes in conjunction with the vascular plants, and this has been rare for insular floras of any part of the world.

It has seemed worth while to trace the evolution of this work from its inception in the youthful activities of the Champlain Society to its publication as a finished piece of scientific record. In several respects the story is illuminating. It shows an extraordinary continuity of purpose. It gives a striking illustration of carefully matured and highly creditable work accomplished by an amateur in scattered intervals of limited leisure. It wonderfully explains the training which Mr. Rand brought to his later work as secretary of our Club, for it makes clear how he had personally acquired experience in collecting, in floristic record, in correlating the results of co-operative work, and finally how in the preparation of his Flora he had acquired extended acquaintance with contemporary specialists and had learned how to value their aid. It had also given him practice in seeing

technical matter carefully through press. Indeed, is it possible to think of a more favorable preparation for the duties which he was in 1895 called upon to assume?

By those, like ourselves, who saw Mr. Rand in his botanical activities, it must be remembered that these constituted merely an avocation, that he was primarily engaged in other duties, that he had an exacting profession. After taking his A.B. in Harvard College in 1881, with a scholarly rank which brought him Phi Beta Kappa honours, he continued his studies in the Harvard Law School and received his LL.B. in 1884 as well as his A.M. from Harvard College. Admitted to the Massachusetts bar in 1885, he entered the practice of the law. For many years he had his office in the Exchange Building—at first on the seventh, later on the tenth floor—in the very heart of Boston's financial district.

In his profession he was highly regarded and is believed to have had talents which would have carried him far had he not preferred a very quiet type of independent practice to association in any of the prominent partnerships, which would have entailed greater stress, with presumably less choice in the direction of his activities and probably less leisure for his avocations.

He was diligent in his work and became specially known as a skillful conveyancer, whose examination of titles commanded high respect and was felt to be of exemplary thoroughness. In this capacity he was one of the lawyers retained in the important legislative case of the Massachusetts Institute of Technology regarding the restrictions of its Boston real estate holdings. He also had considerable practice in wills and probate law and is believed to have been very generous of his time in the legal assistance of many worthy but indigent clients. Rarely, if ever, did he accept court practice. He seemed to be happy in his work and it was often continued far into the night.

His opportunities for botany were restricted to Sundays, holidays, occasional evenings, and his summer outings. These last were with great fidelity spent on Mt. Desert, in his later years at Seal Harbor. There he became one of the best known and most beloved members of the summer colony and took an effective part in the activities of the Village Improvement Society, serving repeatedly upon its committees. He devoted much care to the preparation of what is by all odds the best map of the Island, a time-consuming enterprise of no small magnitude. Fond of boating, he cared little for sailing, but

was a capital tramper, extraordinarily observant, always interesting and interested.

He was one of the most earnest and enthusiastic of the small group of gentlemen of Boston and its suburbs who in the autumn of 1895 met from time to time informally to consider the founding of a botanical club which should include both professionals and amateurs. When in December of the same year, as the outcome of these efforts, the New England Botanical Club was formed, it was he who was chosen its Corresponding Secretary.

Thereafter, for many years, he never missed a meeting either of the Club or of its Council. He personally knew every member—knew them in fact better than they realized. He was so quiet that only his intimate friends perceived how close was his observation of people as well as things. However, his judgment of their characters was kindly rather than critical. He was gifted with a fine sense of humor and though a very silent guest was apt in the course of general conversation to make from time to time whimsical observations which were the more amusing because unexpected.

During the early years of the Club, Mr. Rand was always ready to join in its field-work, if this could be arranged on holidays or at week-ends. In this way he collected at many points within thirty or forty miles of Boston. Longer excursions were not frequent in those motorless days. However, he made several short visits to the Monadnock region, with a large vasculum as an important part of his baggage. There he collected diligently in Jaffrey, West Rindge, Fitzwilliam, Troy, Dublin and Peterboro. He carefully explored the upper parts of the Contookook River and is one of the few botanists who have ascended the broken slopes of Little Monadnock and the ledges on the south side of Gap Mountain. That his holiday gatherings in this region have proved scientifically useful is shown by the fact that some of them have from time to time been cited in Rhodora.

When in the autumn of 1898 our journal was in contemplation he was one of the earliest to regard the plan as feasible and one of the most active in soliciting the several hundred advance subscriptions needful to make it practicable. When the Rhodora Board was chosen he kindly consented to be a member of the publication committee, and thus added further correspondence to that entailed by his duties as secretary. He was very regular in his attendance at the meetings

of the editorial board and gave aid on the literary as well as the business side of the undertaking.

It sometimes happens that the functions of an official become inconspicuous from the very smoothness and efficiency with which they are performed. It was so with Mr. Rand. It is in retrospect that his services can best be appreciated. Twenty-five years is a long term in which to conduct the correspondence of a live organization, to prepare and send out its many notices, to take effective part in nearly all its deliberations, and to aid in the management of its publication. All this Mr. Rand did and did well.

There is another point to be remembered. Such associations as our own can prosper only when a fitting balance is maintained between scientific work and social interest, between research, exploration and scientific record on the one hand and popularization on the other. In preserving this balance, Mr. Rand's uniform tact, vigilant care and sound judgment have been factors of no small importance in the success of our Club.

He scarcely ever addressed the Club except briefly and on business matters.

Aside from his admirable Flora of Mt. Desert his botanical publications were few and of no great extent. In the *Mt. Desert Herald* he published in the summer of 1890 a series of eight articles of a popular nature on the vegetation of the island. To *Garden and Forest* he contributed three brief notes. In Rhodora he published ten short articles, mostly relating to stations for some of the rarer phanerogams in the outlying towns of the Boston District, but including a florula of the Duck Islands on the Maine coast and a list of addenda to his Flora of Mt. Desert.

He long cherished the hope of bringing out a revised and supplemented edition of his Flora and to that end he continued year after year his exploration of Mt. Desert and prepared many specimens. However, he was at length forced to abandon this enterprise, for he became conscious that there were limits beyond which it would be unwise to tax his eyesight, always under considerable strain in the course of his professional work, which involved the close scrutiny of old deeds and obscure probate records.

Mr. Rand gave his herbarium to the New England Botanical Club in 1914. There are portions of it still to be worked over and it is not yet possible to state the extent of the collection. Mr. Rand

himself estimated as far back as 1901 that it contained at least 15,000 sheets, but he subsequently made many additions. It is one of the most important gifts ever received by the Club and as a close record of a local flora covering the lower groups as well as the vascular plants, it is unsurpassed among the many valuable collections of which our Club herbarium has become the repository.

Mr. Rand had a very refined literary taste, was a copious and thoughtful reader and built up a library rich in the best fiction and history as well as in works bearing upon his favorite science.

He wrote letters without number and always in manuscript. He was never reconciled to what Henry James has termed the "inhuman legibility of the typewriter." His business notes had all needful definiteness combined with more human touches. His social correspondence had distinct charm. His messages of sympathy or congratulation were wonderfully expressive of warm feelings delicately worded.

On June 29, 1893, he married Miss Annie Matilda Crozier of Charlestown, a lady of great personal charm. While not herself botanically inclined she was sympathetic with his interest in plants and was a very delightful hostess to his many botanical guests.

Besides the New England Botanical Club there were several organizations to which Mr. Rand was faithfully devoted, namely a local Episcopalian Club, the Military Order of the Loyal Legion, and his dining club, the last—still in existence—being a noteworthy group of men with scholarly interests in the natural sciences.

On May 12, 1921, Mrs. Rand died—a blow from which her husband never recovered. In the autumn of the same year he was stricken down by paralysis. Thereafter, for three years, he led the life of an invalid, but so far recovered his powers that he could sit up, walk about the house, take short strolls in the garden, and even in the care of a nurse make longer journeys to the homes of friends. He was glad to see his friends and to the last retained his interest in the affairs and the members of the New England Botanical Club. At the end, which came October 9, 1924, his passing was mercifully sudden and he was spared conscious suffering.

Among the personal traits of his character which stand out most clearly in our memories of him were gentleness, patience, uniform courtesy, a refined literary interest, a whimsical humor, a cleverness in versification often exhibited at our Club dinners and celebrations.

It will be noted that these are qualities very rarely combined, as they were in his case, with exceptional powers of observation, a trained business judgment and firmness of decision, for his opinions had a fine definiteness and were in matters of importance tenaciously held.

Unflagging loyalty to an avocation, of a scientific and somewhat technical nature, taken up in youth and continued throughout life, is in itself a remarkable achievement. That his botanical activities gave great pleasure to our late friend there can be no doubt. They enriched his life and brought him into a host of human relations which he keenly enjoyed. In return for these pleasures, his services were liberally given and they were of an extent and nature to win for him the enduring gratitude of our Club and insure him an honorable place in the history of botany.

THE WHITE PINE IN MIDDLE TENNESSEE.

H. K. Svenson.

In August, 1922, Mr. W. C. Dickinson of Peabody College, Nashville, and the writer collected plants in the hills west of Nashville, and found on the summit of the high bluffs just south of the village of Craggie Hope, in Cheatham County, about a dozen full-grown specimens of *Pinus Strobus*. This station obviously extends the known distribution of the white pine some distance to the southwest. According to Sargent[1] the distribution of this tree is "Newfoundland to Manitoba, southward through the northern states to Pennsylvania, northern and eastern Ohio, northern Indiana, valley of the Rocky River near Oregon, Ogle County, Illinois, and central and southeastern Iowa, and along the Appalachian Mountains to Eastern Kentucky and Tennessee and northern Georgia." Gattinger[2] in his Flora of Tennessee reports it "from the Cumberland Mountains, and prominently [in] the Alleghenies along the slopes of the highest ridges." In the introduction, pp. 23–24, he makes the following observations: "There are neither pines nor firs the whole length of distance from Pulaski to Elizabethtown, near Louisville, Ky., nor are any to be found for a great distance east or west of this line (Nashville & Decatur Railroad). The scrub pine [*P. virginiana*] is the

[1] Sargent, C. S. Man. Trees N. A. ed. 2: 3–4. (1921.)
[2] Gattinger, A. Fl. Tenn. 31. (1901.)

only species I have ever observed in Middle Tennessee. I found it sparingly and confined to a limited belt of hills around the confluence of the Harpeth and Turnbull Rivers, in Dickson County." This is the very region where we found the white pines, which, from the gravels of Turnbull River, could be seen silhouetted against the sky at the summit of the almost inaccessible bluffs; whereas the more abundant scrub pines were found in the low-lying, sterile soils between the river and Craggie Hope. We also observed *Pinus virginiana* in the oak barrens toward White Bluffs, in Dickson County, a few miles to the northwest. However, the white pine must be of extremely limited occurrence in this region. An ascent of the bluffs showed that it grew rather sparsely on the rich well-drained slope at the summit of the bluffs, several of the mature trees, however, producing cones. Close to the bank of Turnbull River, shaded by the high cliffs, were *Waldsteinia fragarioides*, and *Equisetum hyemale* var. *intermedium*. These are reported by Gattinger only from the Alleghenies, and the entire locality has the appearance of a fragment of the northern Alleghenian forest, isolated in Middle Tennessee. Further exploration was prevented by darkness. Specimens of the plants are in the Gray Herbarium.

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THE NAME SISYMBRIUM.

K. K. MACKENZIE.

THE genus Sisymbrium was described by Linnaeus as follows in the 5th edition of the Genera Plantarum, p. 296, published in 1754:

"728. SISYMBRIUM. * *Tournef.* 109. Radicula *Dill. gen.* 6.

"CAL. *Perianthium* tetraphyllum: *foliolis* lanceolato-linearibus, patentiusculis, coloratis, deciduis.

"COR. tetrapetala, cruciformis. *Petala* oblonga, erecto-patentia, calyce saepius minora, unguibus minimis.

"STAM. *Filamenta* sex, calyce longiora: quorum *duo opposita* paulo breviora. *Antherae* simplices.

"PIST. *Germen* oblongum, filiforme. *Stylus* vix ullus. *Stigma* obtusum.

"PER. *Siliqua* longa, incurva, [gibba,] teres, bilocularis, bivalvis: *valvulis* dissepimento paulo brevioribus.

"SEM. plurima, parva.

"OBS. Sophia *corollam calyce breviorem gerit, & siliquam tenuissimam longissimam.*

"Radiculae D. *siliquam gibbam brevissimam proferunt* [*uti* 1. 2. 3.].

"*Calyx & Corolla in hoc genere patentia.*"

The bracketed words were not in the 1st edition published in 1737 or in the 3rd edition published in 1743 (see page 247). In those editions Linnaeus also had an immaterial observation about *Eruca* which he later omitted.

In the first edition of the Species Plantarum (pp. 657–660) published in 1753, the species of Sisymbrium listed by Linnaeus were (1) Nasturium [aquatic[1]] um; (2) sylvestre; (3) amphibium α palustre, β aquaticum, δ sylvestre; (4) supinum; (5) polyceratium; (6) murale; (7) vimineum; (8) arenosum; (9) monense; (10) asperum; (11) Sophia; (12) tanacetifolium; (13) altissimum; (14) Irio; (15) strictissimum; (16) integrifolium.

In arriving at the proper use of the name *Sisymbrium* it is believed that the following points should be considered:

(1) In the Genera Plantarum Linnaeus gives references to Tournefort under a vast majority of the generic names proposed by him. These references are not to the descriptions of Tournefort, but to his plates. The plates are excellent and carefully prepared detail drawings. In other words, what Linnaeus did with most of his genera was to cite a definite excellent illustration showing exactly what he had in mind. Where he had any doubts whether the way in which Tournefort used a generic name in an illustration was the way in which he himself wished to use it he omitted the reference. For example, Tournefort (pl. 298) has a fine illustration of *Chaetochloa* as *Panicum*, but Linnaeus does not cite this at all.

In the case of *Sisymbrium* the Linnaean reference is to Tournefort's plate 109. This is an excellent detail illustration of the water cress, *Sisymbrium Nasturtium*.

(2) It will be noted that Linnaeus in his generic description says "siliqua longa." He treated species with siliques "longissima" or "brevissima" as belonging to the genus *Sisymbrium*, but he self-evidently did not regard either as typical, because he made special observation about each.

[1] According to the custom of the period, Linnaeus here indicated "aquatic" by an equilateral triangle.

His generic description applies directly to the water cress, and not to such a species as *Sisymbrium altissimum,* which has very long pods.

(3) Special attention has been called to his language "Radiculae D. siliquam gibbam brevissimam proferunt, uti 1, 2, 3" and the argument has been advanced that as "1" evidently refers to the first species treated by him in Species Plantarum (namely the water cress) he by this language intended to indicate that this species was not typical. The following facts about this argument were not however noted by those who advanced the argument.

(*a*) The water cress does not have siliques which anyone would ever think of describing as "brevissimam."

(*b*) Dillenius, from whom the name *Radicula* is cited, treated the water cress as a *Sisymbrium* (Cat. Pl. Gus. 169). His illustration of *Radicula* (plate 6, opposite p. 124 l. c.) cited by Linnaeus is an excellent one of one of the plants we now call *Radicula,* and it has siliques which everyone would at once characterize as "brevissimam."

(*c*) Linnaeus turned out a great deal of work in a hurry and there are many typographical errors in some of his works. He complained of the "carelessness as to corrections" of his printers (Jackson's Life of Linnaeus p. 299); and I am very sure that the views of his printers concerning the manuscript he furnished them would have been most interesting if they had been preserved.

The first edition of the Species Plantarum and its companion volume, the fifth edition of the Genera Plantarum, show in various places unmistakable evidence of this haste. Some of the errors which crept in Linnaeus corrected in subsequent editions, and one of the errors so corrected by him deals with the very words we are now considering.

In other words, in the sixth edition of the Genera Plantarum (p. 338) published in 1764 Linnaeus changed these words to read "uti 4, 5"; and in its companion volume, the third edition of the Species Plantarum, we note (p. 916–7) that species 4 and 5 are species 2 and 3 of the first edition and that species 1 of both editions (the water cress) was omitted from the statement. In other words Linnaeus did not regard the water cress as one of the species to which his remarks about *Radicula* were applicable.

(4) Hill in the British Herbal (p. 245) published in 1756 seems to have been the first reviser of the Linnaean conception of *Sisym-*

brium. He confined the name *Sisymbrium* to the water cresses, saying, Linnaeus "very improperly joins with the water-cresses many plants not allied to them; these we shall give under other regular genera, and in their proper places." Accordingly he assigned some Linnaean species of *Sisymbrium* to *Radicula* (p. 264–5); species 11 (Sophia), species 14 (Irio) and species 15 (strictissimum) he assigned to *Erysimum* (p. 251). To the genus *Eruca* (p. 237) he assigned species 9 (monense) and 6 (murale).

(5) The next reviser was Adanson in 1763 (Fam. Pl. 2: 417). He also confined the name *Sisymbrium* to the water cresses, specifically citing Tournefort's plate 109; and he divided other Linnaean species of *Sisymbrium* among the genera *Kibera* Adans., *Roripa* Scop., *Sophia* Dod, and *Norta* Adans., assigning to these genera respectively the Linnaean species of *Sisymbrium* numbered 4, 3, 11 and 15 and in addition No. 10 to *Roripa.*

(6) The sixteen species given by Linnaeus are now referred to anywhere from nine to eleven different genera. *Radicula* and *Norta* (*Sisymbrium* of various authors) have practically the same number, the exact number depending on the disposition of certain species, which widely varies with different authors.

(7) The name *Sisymbrium* is a very old one. Some of the earlier botanists used it both for species of *Mentha* and for the water cress. Thus in Matthiolus Commentarii x x Dioscorides (p. 292 Italian ed. of 1560; p. 487 ed. of 1565) we find an excellent illustration of the water cress as *Sisymbrium aquaticum,* while on pages 485–6 (last cited edition) we find equally excellent illustrations of two mints, one labeled *Sisymbrium hortense* and the other *Sisymbrium sylvestre.* The use of the name for the mints seems to have soon died out, but the use of the name for species of *Cruciferae* continued. The old authors had just as much trouble in applying names to species of *Cruciferae* as modern authors, and one can find various species assigned to the genus by different authors, but as far as I have seen all authors who used the name at all cited the water cress as one of the species of the genus.

Summing up, the plate of *Sisymbrium* cited by Linnaeus illustrates the water cress; his generic description best applies to the water cress of any of the species given by him; the historic name of the water cress is *Sisymbrium;* the first revisers of the Linnaean genus, Hill and Adanson, both separately and both very properly, restricted the

name *Sisymbrium* to the water cress and removed the other elements to other genera. Under these circumstances, under all codes of nomenclature the name *Sisymbrium* should now be applied to the water cress.

Maplewood, New Jersey.

TWO NEW EPILOBIUMS OF EASTERN AMERICA.

M. L. Fernald.

In 1918 I described from the Magdalen Islands and Newfoundland *Epilobium densum* Raf., var. *nesophilum*.[1] At that time the plant was known only in flower and very young fruit. In August, 1924, however, Messrs. Bayard Long, Boyd Dunbar and I were so fortunate as to secure abundant fruiting as well as flowering material in Newfoundland and to collect the very characteristic stolons which had heretofore been inadequately known. The mature seed is quite unlike that of *E. densum* in having only a very short and scarcely obvious collar, the coma appearing to come directly from the summit of the seed; *E. densum* having a more defined neck. Var. *nesophilum*, furthermore, reproduces by filiform stolons which terminate in subglobose tubers, *E. densum* being non-stoloniferous. These, in addition to the characters originally pointed out: the subsimple to slightly branching habit, in contrast with the dense branching of *E. densum;* the commonly broader leaves; the calyx 4.5–7 mm. long, contrasted with the shorter calyx (3–4.3 mm. long) of *E. densum;* and the large petals (7.5–10 mm. long) contrasted with the small petals (4.2–6.5 mm. long); abundantly distinguish the Magdalen Island and Newfoundland plant from the continental *E. densum* and I now have no hesitation in treating it as

Epilobium **nesophilum** (Fernald) n. comb. *E. densum*, var. *nesophilum* Fernald, Rhodora, xx. 29 (1918).

From *E. palustre*, *E. nesophilum* is quickly distinguished by the close cinereous puberulence of the foliage, the short pedicels, the erect buds with submucronate tips as in *E. densum* and the very large petals; and in large plants the prolonging inflorescences have a strikingly unilateral or scorpioid tendency which is not common in *E. palustre* and I have never seen in *E. densum*.

[1] Fernald, Rhodora, xx. 29 (1918).

In wet peaty or silicious soil in southern Newfoundland, found by us almost wherever we landed, from Trepassey near Cape Race to Port aux Basques near Cape Ray, occurs a little *Epilobium* obviously related to *E. palustre* and *E. nesophilum* in its simple or subsimple habit and slender terete stem, but differing from both in its short oblong or elliptical blunt leaves, oblong and obtuse calyx-segments, and especially in the remarkably prolonged neck of the seed; the seeds of both the other species having the neck exceedingly short and inconspicuous. In its tiny white or barely pink-tinged petals the little plant with long-necked seeds is like some of the varieties of *E. palustre*, especially vars. *labradoricum* Hausskn. and *mandjuricum* Hausskn. both of which occur in Newfoundland; but the seeds of both these varieties are like those of typical *E. palustre* in having merely a very short and scarcely perceptible neck; and the calyx-segments, like those of *E. palustre*, are lanceolate and acutish. The Newfoundland plant seems to be undescribed but it may be what Haussknecht referred to under *E. palustre*, var. *altaicum* Hausskn., an Altai plant with short, obtuse and dilated leaves and "minute" erect flowers, when he said: "Aehnliche Formen sammelte De La Pylaye in Neu-Fundland."[1] The seeds of var. *altaicum* are not described, but that the little plant of Newfoundland here discussed should not be placed under *E. palustre* seems reasonably clear. In view of its general occurrence in southern Newfoundland, where a century ago the remarkable student of the flora, Bachelot de la Pylaie did so much exploring, it seems appropriate to call the plant

Epilobium (Palustriformes) **Pylaieanum**, n. sp., planta pusilla ex rhizomate filiformi; sobolibus subepigaeis filiformibus elongatis; caule simplici vel sparce ramoso gracile 0.3–1.7 dm. alto tereti minute piloso pilis arcuato-incurvis; foliis 5–10-jugis oblongis vel ellipticis obtusis vel apice rotundatis, mediis 0.8–2 cm. longis 2.5–5 mm. latis margine integris revolutis utrinque glabris vel sparse puberulis superne sublucidis; alabastris erectis apiculatis pilosiusculis; floribus parvis 3–5 mm. longis erectis; calycis laciniis oblongis obtusis; petalis albidis vel pallide lilacinis; capsulis 2–4.5 cm. longis junioribus pilis adpressis brevibus cinereo-pubescentibus; pedicellis 1–3.5 cm. longis; seminibus 2 mm. longis fusiformibus apice longe (0.2 mm.) in appendiculum attenuatis, testa papillis brevibus rotundatis dense obsita.

Plant small, from a filiform rhizome; the sobols mostly superficial, filiform, elongate: stem simple or sparingly branched, slender, 0.3–1.7 dm. high, terete, minutely pilose with incurving hairs; leaves 5–10

[1] Hausskn., Mon. Gatt. Epilob. 134 (1884)

pairs, oblong or elliptic, obtuse or rounded at apex, the median 0.8–2 cm. long, 2.5–5 mm. wide, with revolute margins, glabrous on both sides or sparingly puberulent, slightly lustrous above: buds erect, apiculate, minutely pilose: flowers 3–5 mm. long, erect: calyx-lobes oblong, obtuse: petals white or pale lilac: capsules 2–4.5 cm. long, the young cinereous with short appressed hairs: pedicels 1–3.5 cm. long: seeds 2 mm. long, fusiform, tapering to a slender collar 0.2 mm. long; the testa closely covered with rounded pebbling.—Newfoundland: wet bog-barrens, Trepassey, August 16, 1924, *Fernald, Long & Dunbar*, no. 26,862; silicious gravelly slope, Harbour Breton, August 29, 1924, no. 26,863; granitic ledges, Ramea, August 30, 1924, no. 26,864; wet peaty barrens among the gneiss hills back of Port aux Basques, August 31, no. 26,865 (type in Gray Herb.).

In its long-necked seeds and in its ellipitic or oblong leaves *E. Pylaieanum* somewhat simulates *E. nutans* Schmidt of the mountains of central Europe, but the latter species has leafy basal offshoots and decumbent bases and its pink petals are much larger than those of the plant of southern Newfoundland.

Gray Herbarium.

Records of Bidens frondosa var. anomala Porter.—This variety, characterized by its upwardly barbed awns, has been recorded by Fernald[1] from marshes along the lower Schuylkill and Delaware Rivers in Pennsylvania, New Jersey, and Delaware, from the mouth of the Androscoggin River in Maine, and from the vicinity of Halifax, Nova Scotia, and of St. Ann's, Cape Breton. Sherff[2] records it also from Kansas and Nebraska. Specimens collected by the writer in Massachusetts and in the District of Columbia fill in the gap in its northern range and also extend the limits of its known range somewhat to the southward.

On 4 Sept., 1924 I found a colony of half a dozen plants, all belonging to this variety, growing in shingle between houses at Nantasket Beach, Hull, Massachusetts. A specimen of this collection has been deposited in the herbarium of the New England Botanical Club.

In the vicinity of Washington, D. C., var. *anomala* is apparently not particularly rare along the Potomac River and the Chesapeake and Ohio Canal. On 14 Sept., 1921 I found a colony on the shore of

[1] Rhodora **15:** 75. 1913.
[2] Bot. Gaz. **64:** 34. 1917.

Analostan Island, Washington, D. C. In the fall of 1924, I gave special attention to the examination of the various species of *Bidens* for forms with upwardly barbed awns. *Bidens connata* var. *anomala* Farwell, the form of *connata* with upwardly barbed awns, already recorded from Washington by Sherff,[1] was found on several occasions, and three new localities for *B. frondosa* var. *anomala* were also discovered. A single plant of the latter form was collected from the river wall of the Potomac in East Potomac Park, and another at Fox Ferry, D. C., across the river from Alexandria. Both these localities might easily have been reached by seeds from the Analostan Island colony. A thriving colony was found on the banks of the Chesapeake and Ohio Canal, between Locks 10 and 12, near Cabin John, Maryland, growing with *B. connata* var. *anomala*. Specimens have been deposited in the Gray Herbarium and the National Herbarium.—S. F. Blake, Bureau of Plant Industry, Washington, D. C.

The third Edition of Grout's Mosses with a Hand-Lens.—To the amateur and to the professional botanist whose chief interest lies in other groups of plants, the news that Grout's *Mosses with a Hand-Lens* has appeared in a new edition is very welcome. The work itself needs no introduction, for it has been widely used ever since the first edition appeared in 1900. The inclusion of hepatics in the second edition in 1905 made the work much more useful, since the novice frequently collects the leafy hepatics along with his mosses.

In the present edition[2] the introduction has been rewritten and expanded to three times its former length, making the work more available as an elementary text book of bryology as well as a flora for beginners. The treatment of the Sphagnaceae has been expanded from three to eight pages and that of the other mosses has been revised and four species added.

Dr. M. A. Howe has rewritten the treatment of the hepatics, making it more nearly equal and parallel to that of the mosses. The num-

[1] Bot. Gaz. **64:** 34. 1917. The record of *Bidens bidentoides* (Nutt.) Britton in the "Flora of the District of Columbia and vicinity," Contr. U. S. Nat. Herb. **21:** 289, 1919, is based on the Vasey specimen of *B. connata* var. *anomala* mentioned by Sherff, and on another specimen of the same variety collected near Cabin John, Md., by W. R. Maxon. Genuine *B. bidentoides* has not been found in the District of Columbia region.

[2] Grout, A. J., Mosses with a hand-lens, third edition, a popular guide to the common or conspicuous mosses and liverworts of the north-eastern United States. Liverworts by M. A. Howe, published by the author, 1 Vine St., New Brighton, Staten Island, New York City. xv + 339 p. [1924]. Price $3.50.

ber of pages dealing with the former is more than double that of the earlier edition and thirty-four more species are described.

Perhaps the most striking change in the present edition is the addition of about one hundred illustrations. A large number of photographs, by the author and others, showing the habit and occasionally the habitat, have been added. These have been reproduced very well in half-tone and add much to the attractiveness of the work.—Carroll W. Dodge, Farlow Herbarium.

The date of the January issue (unpublished as this goes to press) will be announced later.

Farlow Bot. Lab.

Rhodora

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THE VALIDITY OF ELEOCHARIS QUADRANGULATA.

M. L. Fernald.

(Plate 149.)

In revising the treatment of *Eleocharis* for the 7th edition of Gray's Manual it was not found satisfactory to follow Dr. Britton in reducing to the tropical American *E. mutata* (L.) R. & S.[1] the plant of temperate eastern North America which was described by Michaux as *Scirpus quadrangulatus*[2] and which under Eleocharis becomes *E. quadrangulata* (Michx.) R. & S.[3] Subsequently, however, the latter plant has continued to be treated by Dr. Britton and by those who have not checked his identification, as strictly identical with the tropical *E. mutata* and the present writer has frequently been called upon to explain this discrepancy in the treatment of *E. quadrangulata*. The question coming anew, it seems desirable to point out the characters of the three species which are often confused under the blanket-name *E. mutata*.

The first of these plants published was *Scirpus mutatus*, described in Elmgren's dissertation under Linnaeus, *Pugillus Jamaicensium Plantarum*.[4] The original description was brief:

SCIRPUS *mutatus;* admodum similis *Scirpo articulato*,
sed differt culmo triquetro, minime articulato;

but in the 2d edition of the *Species Plantarum* Linnaeus made it clear that *S. mutatus* has the culms not "less articulated" but "not articulated:"

[1] R. & S. Syst. ii. 155 (1817).
[2] Michx. Fl. Bor. Am. i. 30 (1803).
[3] R. & S. l. c. (1817).
[4] L. Amoen. Acad. v. 391 (1760).

Simillimus S. geniculato, sed Culmus triqueter, molliusculus, nec articulatus.[1]

The plant of temperate eastern North America was clearly described under *Scirpus* by Michaux.

QUADRANGULATUS. S. aphyllus; culmis stricte erectis, acute quadrangulatis: spica longo-cylindrica; squamis rotundato-obtusis.

Obs. Affinis *S. mutato.*

Hab. in Carolina.[2]

In the *Illustrated Flora,* Dr. Britton[3] reduced *E. quadrangulata* without reservation to *E. mutata,* although in the description he overlooked the 3-angled culms of the latter species and ascribed to *E. mutata* (incorrectly) "culms sharply 4-angled"; and he also ascribed to *E. mutata* a "conic acute tubercle, which is truncate or contracted at the base," the characteristic tubercle of the northern *E. quadrangulata* but by no means of the tropical plant with 3-angled culms generally passing as *E. mutata;* and the artist correctly figured the 4-angled culms and the outline of the characteristic achene and tubercle of the northern plant. In the 2nd edition of the *Illustrated Flora,* however, the correct illustration of *E. quadrangulata* was retained, the description (as *E. mutata*) was recast to include some characters of the tropical plant: "culms sharply 3–4-angled," and the achene capped merely by "the conic acute tubercle,"[4] with nothing said, as in the 1st edition, about its being contracted at base. Similarly, in the *Botany of Porto Rico and the Virgin Islands,*[5] Dr. Britton, although not definitely citing *E. quadrangulata* as a synonym, gives *E. mutata* a range including "eastern United States" and culms "3–4-angled."

When the achenes of the temperate American plant with 4-angled culms, *E. quadrangulata,* are examined they are found to have a clearly defined neck below the elongate tubercle (figs. 1–4); when the achenes of the tropical American plant which seems to be *E. mutata*[6] (a plant with 3-angled culms) are examined they show a thick collar, rather

[1] L. Sp. Pl. ed. 2, i. 71 (1762).

[2] Michx. l. c. (1803).

[3] Britton in Britton & Brown, Ill. Fl. i. 249, fig. 578 (1896).

[4] Britton l. c. ed. 2, i. 311 (1913).

[5] Britton, Sci. Surv. Porto Rico and Virgin Ids. v. pt. i. 90 (1923).

[6] Such Jamaican material as is at hand agrees with the descriptions of Grisebach and of Clarke in having the achene smooth or very finely and delicately cancellate; accordingly this tropical American plant with most delicately cancellate achene is here understood as *E. mutata.*

than a slender and collarless neck projecting about the base of the style (figs. 12–14). Furthermore, in *E. mutata* the mature achene (including the tubercle) is only 1.7–2.3 mm. long, the achene of *E. quadrangulata* measuring (with the tubercle) 2.7–4.2 mm. long. The characteristic differences in the achenes of *E. mutata* (figs. 12–14) and *E. quadrangulata* (figs. 1–4) are brought out in the drawings which Dr. Arthur M. Johnson has most kindly made from specimens selected from a wide geographic range: fig. 1 from Missouri, 2 from New Jersey, 3 from central New York, 4 from eastern Massachusetts; 12 from the island of St. Jan (Danish West Indies), 13 from Venezuela, 14 from French Guiana. *E. mutata* occurs on various West Indian islands (seen from Jamaica, St. Jan and Guadeloupe), in Venezuela, British Guiana, French Guiana, Brazil, Colombia and Panama. It has been reported from Albemarle Island in the Galapagos group but the achene of the Albemarle plant (fig. 11) is not characteristic, having a more definite neck than in the other plants and further collections may show it to be worthy separation. *E. quadrangulata* occurs from eastern Massachusetts to southern Ontario, south to Georgia, Louisiana and eastern Texas.

The third species which is generally passing in tropical America as *Eleocharis mutata* has, like that species, a 3-angled culm but its pale-green to olive-green achenes are globose-obovoid and more coarsely sculptured than are the olive to brown achenes of *E. mutata* and there is a distinct constriction below the tubercle, somewhat as in the northern *E. quadrangulata*. In *E. mutata* (figs. 12–14) the longitudinal ribs of the achene are about 50 in number, rather crowded and in mature fruit often inconspicuous; in *E. quadrangulata* the larger and in maturity castaneous achenes are similarly marked; but in the tropical American plant with 3-angled culms and pale-green to olive-green globose-obovoid achenes with constricted neck (figs. 5–10) there are only 20–30 remote longitudinal ribs conspicuous at maturity and connected by rather distinct cross-ridges. And this plant has achenes intermediate in size between those of *E. mutata* (figs. 12–14) and of *E. quadrangulata* (figs. 1–4). In the former, as already stated, they are 1.7–2.3 mm. long; in the latter 2.7–4.2 mm. long; while in the third species (figs. 5–10) they measure 2–2.8 mm. in length. In its technical characters this third species is a close match for oriental specimens of *E. fistulosa* (Poir.) Schultes.[1] Specimens

[1] Schultes, Mant. ii. 89 (1824).

of the latter in mature fruit from India, China and Ceylon (fig. 6), from Sierra Leone (fig. 5) and from central Africa are in habit quite identical with and show achenes essentially inseparable from those of plants of Cuba (fig. 7), Colombia, Paraguay, Panama (fig. 10) and Vera Cruz (fig. 9) and from Chatham Island in the Galapagos (fig. 8).

In fact, in 1869 Boeckeler recognized this identity of the tropical American with the oriental plant, accurately describing *E. fistulosa* (as *Heleocharis*) and citing[1] specimens not only from India, Ceylon and Madagascar but from Jalapa (Vera Cruz), Brazil, British Guyana and the West Indian island of Guadeloupe. Caruel, likewise, recognized it as an American plant when he reported[2] it from Chatham Island in the Galapagos, and Stewart[3] also reported it from Chatham Island. Stewart's specimens in mature fruit are quite typical (fig. 8). Nevertheless, the late C. B. Clarke wholly ignored or discredited the occurrence of *E. fistulosa* in tropical America, treating[4] the American plants and references as all belonging to *E. mutata*. That *E. mutata*, *E. fistulosa* and *E. quadrangulata* are abundantly distinct should be obvious from Dr. Johnson's drawings of the achenes of the three species.

Gray Herbarium.

Explanation of Plate 149.

Figs. 1–4, achenes of *Eleocharis quadrangulata*, × 10; 1 from Newton Co., Missouri (*Bush*); 2 from Sussex Co., New Jersey (*Porter*); 3 from Cayuga Co., New York (*Eames, Randolph & Wiegand*, no. 11,410); 4 from Norfolk Co., Massachusetts (*Fernald & Wiegand*, no. 133). Figs. 5–10, achenes of *E. fistulosa* × 10; 5 from Sierra Leone (*Scott Elliot*, no. 4453); 6 from Ceylon (*Thwaites*, no. 3162); 7 from Cuba (*Wright*, no. 3376); 8 from Chatham Island (*Stewart*, no. 1080); 9 from Vera Cruz (*Botteri*, no. 756); 10 from Panama (*Pittier*, no. 4557). Figs. 11–14, achenes of *E. mutata* × 10; 11 doubtful plant from Albemarle Island, Galapagos (*Snodgrass & Heller*, no. 261); 12 from St. Jan, Danish West Indies (*Eggers*); 13 from Venezuela (*Broadway*, no. 580); 14 from French Guiana (*Broadway*, no. 203).

[1] Boeckeler, Linnaea, xxxvi. 472 (1869–70).
[2] Caruel, Rendic. della R. Accad. dei Linc. v. 622 (1889).
[3] A. Stewart, Proc. Cal. Acad. Ser. 4, i. 43 (1911).
[4] C. B. Clarke in Urban, Symbolae Antillanae, ii. 61 (1900).

THE INFLORESCENCE AND FLOWER-FORM IN POLYGONUM, SUBGENUS PERSICARIA.

E. E. Stanford.

The inflorescence of the subgenus Persicaria consists typically of a series of fascicles of small pedicellate flowers disposed along a lengthened axis. Each fascicle is subtended by a characteristic, more or less obliquely turbinate structure, the ocreola. The single flowers are each enveloped in a bract resembling the ocreola, but often so diaphanous or so hidden within the ocreola as to escape observation. The ocreolae, and consequently the fascicles within them, are spirally arranged; in the younger stages closely appressed and imbricated, concealing the buds. Later the rhachis usually elongates somewhat, and the ocreolae, in the more loosely flowered species, become somewhat separated and plainly visible, being then usually rather herbaceous in texture. In the dense-flowered types they may be nearly or quite hidden by the developing flowers, being then usually thinly membranous, in color and texture resembling the ocreae, of which they may be considered a floral counterpart. Most commonly the intervals between the ocreolae are fairly uniform, but in some species, especially the more laxly flowered, the basal grouping may be irregular or interrupted.

The number of flowers within an ocreola varies from one or two to seven or eight; most commonly a median number is found. The succession of flowering of the inflorescence as a whole is from the base to apex. The flowers of each fascicle also mature in a succession which may take some days or even weeks for its completion; often the first to appear in a particular fascicle have matured and disappeared considerably before the last have appeared above the margin of the ocreola.

In most American floras the terms spike, raceme, or spike-like raceme are used in reference to the inflorescence of these plants. As to the first, the flowers are plainly not sessile, the pedicels in all cases being evident even on casual examination, and in some cases much exserted and exceeding the accrescent calyx in length. The term raceme is usually applied to a simple inflorescence. For this rather peculiar compound type of floral arrangement the somewhat unsatisfactory term of spiciform or spicate panicle is perhaps the most appropriate.

The flowers are extremely simple, consisting of a 5-cleft (in some species sometimes, or even typically, 4-cleft) calyx, on the base of which, surrounding the ovary, are borne from 5 to 8 stamens; if more than five, of two series, in maximum 5 and 3. The latter case is considered the typical number; lesser numbers arise by reduction of the inner of the two whorls. Alternating with the attachment of the filaments, and often placed somewhat lower than that level, are glandular nectaries, which vary considerably in their development, being usually reduced in the smaller and more inconspicuously flowered species, and much larger in the more showy types, some of which are rather important honey-plants. The lenticular or trigonal ovary is surmounted by a cleft style whose segments are equivalent in number to the angles of the ovary. Each segment ends in a capitate or sometimes clavate stigma.

Collectors who have particularly observed this group of plants may have noted that the majority of the flowers open but briefly or remain closed. Stamens and styles are usually included, or barely exserted. Closer observation usually reveals, especially in terminal and well-developed panicles, some scattered flowers which are widely open, with stamens much in evidence and style less noticeable. In herbarium sheets the majority of the still present flowers are closed and bear achenes, usually well developed, but among these remain some flowers still wholly or partially open, whose ovaries show no sign of developing into fruit. The first impression, in field or herbarium, is that the open flowers represent immature or accidentally unfertilized specimens. A closer scrutiny of both open and closed flowers in various stages of development indicates, however, that here are two classes of flowers, which, though rather similar macroscopically, are quite different in function.

The open-type flowers appear always to be smaller, and the later to develop, in the fascicle. Their anthers are well developed and fully polleniferous. The pistil in the bud and early flowering stages appears quite normal, but in comparison with the other type of flower is smaller, and seems rarely or never to develop into a perfect achene. Commonly the open flower drops soon after anthesis, which is nearly simultaneous with the unfolding of the sepals. Not infrequently, however, it remains long enough to indicate rather conclusively, by its general withered appearance and the persistence of adherent pollen on the stigma, that its retarded development is a matter of organization and not of chance.

The inner structures of the more abundant fertile flowers show somewhat more variability. The styles are typically well developed; in some cases with straight branches; in others with the members more or less curled, sometimes in a complete circle, whereby the stigmas are held, while the flower is closed, in immediate proximity to the anthers. The anthers show, in different specimens of the same species, and in different species, various degrees of development. Usually they produce a fair quantity of pollen, though never the profuse amounts characteristic of the open flowers. As anthesis occurs before, or simultaneously with, whatever opening of the calyx may occur here is clear evidence of cleistogamy. A further evidence may be found in the common experience of collectors that specimens of this group, collected apparently with flowers and achenes in all stages of maturity, will, upon drying (particularly if the process is somewhat delayed) present a very high per cent of mature achenes and few gradations (in the fertile flowers) between these and the bud stage.

In some cases no pollen at all can be found in the partially developed and shriveled anthers. Yet (except in the rather special conditions noted in the amphibious group and to be described in another paper) these are often fully fruitful. The common appearance of shrunken pollen on the persistent stigmas may be held to indicate that actual fertilization and not apogamy has taken place.

In some members of the group, then, are found, in their extremes at least, three distinct types of flowers—in the terminology of Kerner pseudo-hermaphrodite male, pseudo-hermaphrodite female, and cleistogamous. Ordinary propagation evidently takes place by means of the cleistogamous type. Occasional cross-fertilization, including whatever hybridization may take place, presumably occurs by means of the pseudo-hermaphrodite types. Meehan,[1] the only American observer who appears to have published on these floral variations in Polygonum, reports that insects frequently visit the pseudo-hermaphrodite male flowers, but never, according to his observation, the cleistogamous ones, though these often open after close-fertilization has occurred. This writer did not note the presence of the pseudo-hermaphrodite female flowers—which, indeed, are very rare, if occurring at all, in some species, e. g., *P. pensylvanicum*, although occurring much more commonly in others, such as *P. hydropiperoides*. The presence of considerable quantities of foreign pollen, as observed

[1] T. Meehan, *Dimorphism in Polygona*. Acad. Nat. Sci. Phila. Proc. 1889, 59–61.

by the present writer in many of the open-type flowers, may be taken to corroborate the evidence of insect visitation. Actual cross fertilization by this means cannot be said to be absolutely proven, depending as it does mainly on visitation of the rather rare flowers of the virtually pistillate types by an insect loaded with pollen from one of the other types. The close proximity of the small flowers of this group, the considerable development of nectaries, and the reputation of the plants as bee-pasturage, adds probability to this form of transfer. The pollen of the group cannot be considered as produced in sufficient amounts, or as of the requisite type, to render transfer over great distance by wind feasible. In the subgenus Persicaria we have a group whose members have produced no well-defined mechanism of fruit transportation. The comparatively heavy achenes drop close to the parent plant, resulting under suitable conditions in succeeding seasons, in dense masses of plants whose inflorescences are thrust into close proximity above the foliage. Anthers of the virtually staminate flowers are usually thrust prominently outward, if not actually exserted. The pollen is shed readily. Given the occurrence of virtually pistillate flowers on a nearby plant, fertilization by geitinogamy seems a simple and probable way of insuring the fruit development which, as before noted, is usually found in the pseudo-hermaphrodite female panicles.

The type of polymorphy especially characteristic of the amphibious Persicarias has long been known in Europe, but seems to have escaped notice in American floristic works. Typical descriptions of the plants which have passed as *Polygonum amphibium* L. and *P. Muhlenbergii* Wats. in this country indicate both as having stamens and styles exserted. This condition indeed exists, but it is not the invariable one. Polymorphy here takes the form of what is usually termed heterostyly, and the term will be used here, although as far as the amphibious members of the group are concerned, the actual differences of elongation chiefly concern the stamens. One form, the long-styled, has the style-divisions exserted, while the stamens are invisible in the nearly closed calyx. In the short-styled form the flowers open widely, and the style-branches also appear, but with and somewhat surpassing them are the ends of the filaments and the anthers. The actual difference in length between the styles of the two forms is less than would at first appear; the amount of exsertion depends also on the length of the ovary, which in the short-styled form is much reduced

and only rarely develops into an achene. If such development occurs, the style usually elongates somewhat further after anthesis, and the conditions closely parallel the proterandry descrbed by Mueller[1] for the European *P. Bistorta.* Usually the virtually staminate flowers are, like those described above for the more typical members of the genus, quite infertile. Together with this heterostyly goes, typically at any rate, the segregation of the two types of flowers on different plants.

In the bud-stage the two-parted styles of the long-styled flowers are curled within the bud with the stigmas outward. As the flower opens the styles straighten and protrude strongly from the perianth. The styles usually remain exserted, though somewhat recurved, in fruit. The stamens are reduced in varying degrees; the anthers are thin-walled; and, as compared with the other form, smaller and somewhat shrunken. At most they contain but a few grains of pollen. Often they are quite empty. In the amphibious group this condition is accompanied by a high percentage of infertility. The rather showy and close-packed flowers possess well developed nectaries. Insects are probably responsible for such cross-fertilization as takes place. The usual closure of the long-styled flowers must hinder the process. While in the flowering stage no morphological difference between the flowers of a virtually pistillate panicle is evident, it seems highly probable that there are other causes of the high degree of sterility which lie deeper than failure in the transfer of the pollen. In *P. amphibium* L. and its American representative, *P. natans* (Michx.) Eaton, terrestrial forms flower rarely and appear still more rarely fertile than the aquatic. Achenes of terrestrial forms found in herbarium-material are usually imperfectly developed; so much is this the case that immaturity cannot be held wholly responsible for it. As achenes fall soon after maturity, the appearance of herbarium-material often exaggerates the actual degree of infertility in these plants, but it is certainly far more general than that found in other American species. In *P. coccineum* Muhl., which is more completely adapted to the terrestrial habitat, the dry-land forms more frequently produce fertile achenes. As previously noted, the long-styled forms open more or less, but in the event of fertilization at least, evidently rather briefly. During the development of the achene it is closely invested by the accrescent calyx. At maturity this is still tightly closed,

[1] Herman Mueller, Die Befruchtung der Blumen durch Insekten, 175 (1873).

considerably exceeding the fruit; it must be a factor of considerable importance in keeping the heavy achene afloat in water-currents and thus increasing the distribution of the species. These plants, however, must depend chiefly for their propagation on the long running or, in aquatic states, semi-floating rhizomes, which extend themselves very rapidly under suitable conditions. The long, meagerly rooting aquatic stems easily break off under stress of storm, current, or other strain, and, floating away, root readily where they happen to come to rest. The extreme development of these organs of perennation as compared with that in other members of the subgenus which produce achenes in profusion suggests that here we have floral degeneration consequent upon perfection of vegetative means of reproduction. Certain other observations, to be touched upon in in another paper, indicate the presence of still other factors, at least as regards the American species, and the matter can by no means be regarded as settled, nor of easy settlement.

In view of the well-known occurrence of this type of polymorphy in the European *Polygonum amphibium* L., and the considerable study that the group to which it belongs has received in this country, it seems the more remarkable that the phenomenon has so far escaped notice on this continent. It may be mentioned that the habit-drawings of the species most concerned in Small's Monograph[1] plainly show the long-styled forms. The text and the detail-drawings, however, indicate the exsertion of both sets of essential organs. Some 45 American species of this group have been proposed by various writers who failed to note the development of two types of flowers on separate plants. Those not especially concerned with the multiplication of names will view this lack of observation with a certain degree of philosophy. Nieuwland, the principal present day exponent of the views of Greene[2] regarding this group, in a paper[3] published subsequent to his extensive review of the American Polygonums[4] sought to reduce *P. longistylum* Small to the problematical *P. bicorne* Raf. on the ground that the former alone in the American flora possesses exserted styles. *P. bicorne* will be dealt with more at length

[1] Small, *Monograph of the North American Species of the Genus Polygonum*. Mem. Dept. Bot. Columb. Col. i. (1895).

[2] E. L. Greene, *Certain Polygonaceous Genera*. Leaflets of Bot. Obs. and Crit. i. 17–50 (1904).

[3] Nieuwland, *Polygonum longistylum Small, a synonym*. Am. Midl. Nat. iii. 200, 201 (1914).

[4] Nieuwland, *Our amphibious Persicarias*, Am. Midl. Nat. ii. 1–24. 200–247 (1911–12).

in another paper dealing primarily with the systematic standing of *P. longistylum* Small and its close relatives.

P. longistylum, originally described from the long-styled form alone, was reported by Robinson[1] as heterostyl, and the fact also noted by that author and Fernald in the seventh edition of Gray's Manual. In contradistinction to the conditions in the amphibious group, the style in *P. longistylum* is definitely reduced in the short-styled form. Here, also, short-styled forms tend to sterility, but the percentage of barrenness is by no means so great as that which obtains in the amphibious group. Usually a short-styled panicle will produce at least a few apparently normal fruits. Here, as in the amphibious group, the flower-types are segregated, or virtually so, so that the condition is practically a dioecious one. A perennial plant described as new in another paper in this series displays the same type of heterostyly.

It is of interest to observe that in *Polygonum pensylvanicum,* closely related to *P. longistylum,* and still more in *P. mexicanum,* of the same group, a trend toward heterostyly may often be observed, but, so far as noted by the writer in the examination of a considerable amount of material, it does not reach the point of segregation of types, nor does there appear to be any great variation among plants in percentage of sterility.

It is highly probable that a study of the flower-form of members of the subgenus Persicaria in other sections of the world will bring to light other cases of heterostyly.

Western Reserve University.

PROPER USE OF THE NAME LEONTODON.

K. K. Mackenzie.

The English name dandelion, the French name dent-de-lion, and the Latin names dens-leonis and leontodon all mean exactly the same thing and have the same derivation. As stated by Tournefort in 1719 (Instit. 469). "Dens leonis à foliorum formâ, quae Leonis maxillam dentibus suis instructam aemulari existimatur."

Tournefort treated the dandelions and related plants under the generic name Dens leonis. Linnaeus rejected double headed generic

[1] Robinson, *Notes on some Polygonums of western North America.* Proc. Bost. Soc. Nat. Hist. xxxi. 265 (1904).

names, and directly substituted the name Leontodon (Philosophia Botanica 160 sec. 221).

Following is the description of the genus Leontodon given by Linnaeus in 1754 in the fifth edition of the Genera Plantarum.

"817. LEONTODON.* Dens Leonis *Tournef.* 266. *Vaill. A. G.* 1721. 50. 12. Taraxaconoides *Vaill. A. G.* 1721. 21.

"Cal. *Communis* imbricatus, oblongus: *Squamis interioribus* linearibus, parallelis, aequalibus, apice dehiscentibus. *S. exterioribus* paucioribus, saepe reflexis ad basin.

"Cor. *Composita* imbricata, uniformis: *corollulis hermaphroditis* numerosis, aequalibus.

"*Propria* monopetala, ligulata, linearis, truncata, quinquedentata.

"Stam. *Filamenta* quinque, capillaria, vix notabilia. *Anthera* cylindracea, tubulata.

"Pist. *Germen* infra corollam propriam. *Stylus* filiformis, longitudine ferme corollae. *Stigmata* duo, revoluta.

"Per. nullum. *Calyx* oblongus, rectus.

"Sem. solitaria, oblonga, scabra, terminata *Stipite* longissimo, pappigero.

"Rec. nudum, punctatum.

"Obs. Dens Leonis *V.* pappo *simplici seu capillari gaudet, & calycis squamis exterioribus reflexis.*

"Taraxaconoides *V.* Pappo *plumoso seu radiato & calycis squamis omnibus erectis distinguitur.*"

In the first edition (1753) of the Species Plantarum (p. 798) the following species are listed:

(1) *Taraxacum;* (2) *bulbosum;* (3) *Dandelion;* (4) *autumnale*; (5) *tuberosum;* (6) *hispidum.*

No. 1 is the common dandelion and represents the group treated by Linnaeus as typical *Dens Leonis.*

No. 2 is a species of *Crepis* (Index Kewensis).

No. 3 is the North American *Krigia Dandelion.*

Nos. 4 and 5 and 6 belong to the genus treated in Britton and Brown's Illustrated Flora as *Apargea* and belong to the group *Taraxaconoides* referred to by Linnaeus.

The first use of the name *Taraxacum* after 1753 with which I am acquainted was by Ludwig Def. Gen. 175 (1760), referred to in Gray's Manual. Ludwig included in *Taraxacum* the same two groups *Dens Leonis* and *Taraxaconoides* as did Linnaeus. He did not divide the genus. He merely substituted the name *Taraxacum* for *Leontodon.*

In 1763 Adanson (Fam. Pl. 2: 112) divided the genus into *Virea* and *Leontodon*. He retained the name *Leontodon* for *Dens Leonis* of Tournefort (Table p. 569), and established the genus *Virea* for *Taraxaconoides* Vaill. (Table p. 618), citing as a species "Dens leon foliis hirsut. hieracium, C. B. Prod. 63." i. e., Leontodon hispidum L. As far as I have found he was the first author to divide the genus, and he divided it entirely correctly.

In 1772 Scopoli (Fl. Carn. (Ed. 2) 2: 99, 111) divided the genus in a different way. For the common dandelion he constituted the genus *Hedypnois*, and he retained the name *Leontodon* for the species forming the group referred to by Linnaeus as *Taraxaconoides*. Out of this failure of Scopoli to pay attention to the previous work of Adanson has arisen I believe the nomenclatural troubles in the group.

The carefully worked out provisions of the American Code of Nomenclature require the use of the generic name *Leontodon* for the common dandelion and its allies. These provisions are very clear and specific.

The much less carefully worked out provisions of the International Code are in the present case equally definite. That code provides "When a genus is divided if the genus contains a section or some other division which, judging by its name or its species, is the type or origin of the group, the name is reserved for that part of it." Under this provision it is self-evident that the Linnaean generic name *Leontodon* must be reserved for the group referred to by him as *Dens leonis* and not for the group *Taraxaconoides*. If one uses the method of residues the same result is again reached.

The use of the name *Leontodon* for a group of plants to which the common dandelion is not referred is directly contrary to the provisions both of the American Code and the International Code. It should be abandoned.

Maplewood, New Jersey.

CLADONIA MATEOCYATHA, A NEW SPECIES, AND SOME VARIATIONS IN C. BEAUMONTII.

C. A. Robbins.

The Cladonia collector, particularly if his activities take him into eastern Massachusetts, is sure to meet with a plant which, in well developed states, might suggest to him a relationship to *Cladonia*

degenerans (Floerk.) Spreng. Some collectors have indeed referred examples of it to that species. It is, however, not without difficulty thus referred and a series of plants taken from widely separated regions shows that the plants possess constant characters which are lacking in *C. degenerans* and in other species of Cladonia. Because of this and also because of its wide distribution,—Sandstede states that it has been received in Europe from several stations in North America,—it seems desirable to recognize it as a distinct species.

Cladonia **mateocyatha** sp. nov., primary squamules persistent or disappearing, medium size to large, broadly oblong, entire or subrotundly lobate, margins entire or sparingly subdentate, esorediate, KOH–; podetia with cups, 5–35 mm. long, 4–8 mm. in diameter, stout, erect or suberect, corticate, simple to several-ranked; proliferations usually from the margins of the cups or occasionally from the centers, short, irregularly turgescent, subtruncate, cups closed, irregular or abortive, or even wholly obliterated by the proliferations; cortex continuous or areolate, smooth to rugose, esorediate, esquamulose or sparingly squamulose toward the base, grayish-green in shade or becoming olivaceous to dark-brown in sunny situations, KOH–; apothecia reddish-brown to brownish black.

In small clusters and large spreading colonies, on sandy loam; in old, neglected fields, open upland woods, sandy banks, etc.

This species should be distinguished from *C. degenerans* (Floerk.) Spreng. which, in some forms, has abortive cups, but is more slender, the cortex is more dispersed with the decorticate areas more arachnoid. *C. gracilis* (L.) Willd. f. *dilacerata* Floerk. has oblique cups but they are rarely wholly obliterated and the proliferations are marginal, the podetia longer and more slender.

C. mateocyatha Robbins, f. **squamulata** f. nov., similar to the typical form of the species but with the podetia and margins of the cups squamulose.

C. Santensis Tuck. b. *Beaumontii* Tuck. was described as having the "podetia elongated; cylindrical; very slender, dichotomously much-branched, and intricate; the summits cristate-ramulose."[1] Vainio[2] raised the form to specific rank, adding little to his description[3] which is a literal translation of the original, beyond the statement that it is near *C. Gorgonina* but its primary thallus is more per-

[1] Tuckerman, E. A synopsis of the North American lichens, **1**: 245. 1882.

[2] Vainio, E. Monographia Cladoniarum universalis. Acta Soc. pro Fauna et Fl. Fennica **10**: 455. 1894.

[3] Ibid. **4**: 411. 1887.

sistent, its podetia shorter and becoming intensely yellow with KOH. Neither author mentions any tendency in the plant to vary and it is to be noted that, so far as the descriptions indicate, both consider it strictly esquamulose. Nevertheless it often occurs in a more or less densely squamulose condition[1] and as this condition is taken to constitute a formal character in this genus, the variation should be recorded in order to bring the species into agreement with current practice. A pale-fruited state, not before described but similar to recorded states of *C. cristatella, C. pyxidata* and other species should also be noticed.

C. Beaumontii (Tuck.) Vainio f. **elegans** f. nov., podetia squamulose throughout; otherwise similar to the typical form of the species.

f. **pallida** f. nov., apothecia pallid or pale flesh color.

The squamulose state is well exhibited and common in the wooded country about Buzzards Bay. Material from Florida in the writer's herbarium approaches it. The pale-fruited state is rare.

Onset, Massachusetts.

Late-blooming Violets in Connecticut.—On October 25, 1924, I found several plants of *Viola scabriuscula* in bloom in Suffield. In size and appearance these plants resembled those of the species as they are found in the spring, when the first few flowers open. A few buds were seen, but no capsules were formed from these unseasonable flowers.

These plants were growing in a swamp from which the timber had been cut, probably in the winter of 1922–3. The ground was screened and protected by small growth and trimmings from the felled trees, while a wooded slope on the west sheltered the spot from the prevailing cold winds.

On Nov. 2, and again on Nov. 15, I gathered, on a sandy knoll with a western exposure, several blossoms of *Viola pedata*.—Jesse F. Smith, Suffield School, Suffield, Connecticut.

[1] Robbins, C. A. Cladonia Beaumontii in Massachusetts. Rhodora 25: 46–47. 1923.

A White Mountain Flora. New England botanists long waited, often with impatience, the appearance of Pease's *Vascular Flora of Coös County, New Hampshire*,[1] for they all knew that the most thorough student who has devoted his attention to the flora of the White Mountains would produce something worth while. In this expectation they are in no way disappointed. To some the very detailed enumeration of species and all their known stations will appeal; to others the clear presentation of the *Introduction*, covering geographic, hydrographic, orographic, lithological (by W. O. Crosby), climatic, floristic and historical fields will seem more important. The last, with its list of botanical explorers and the dates of their trips, from Manasseh Cutler's pioneer expedition of 1784 to the date of publication, is immensely valuable and sets a highly important standard for other students of local floras. The *Bibliography*, too, is remarkably full and the significance of the different publications is stated. In nomenclature and classification the *Catalogue* follows the 7th edition of Gray's Manual but brings to date the treatments of groups studied since 1908. The plates are beautiful reproductions from photographs of *Silene acaulis*, var. *exscapa*, *Cassiope hypnoides*, *Phyllococe coerulea*, *Loiseleuria procumbens*, *Diapensia lapponica*, *Solidago Cutleri* and *Arnica mollis*. Everyone who is interested in the White Mountains or their flora will want this invaluable and authoritative book.—M. L.F.

[1] Arthur Stanley Pease, Proc. Bost. Soc. Nat. Hist. xxxvii. no. 3. pp. 39–188, 7 plates. Boston, July, 1924.

Vol. 27, no. 313, including pages 1 to 16, was issued 3 March, 1925.
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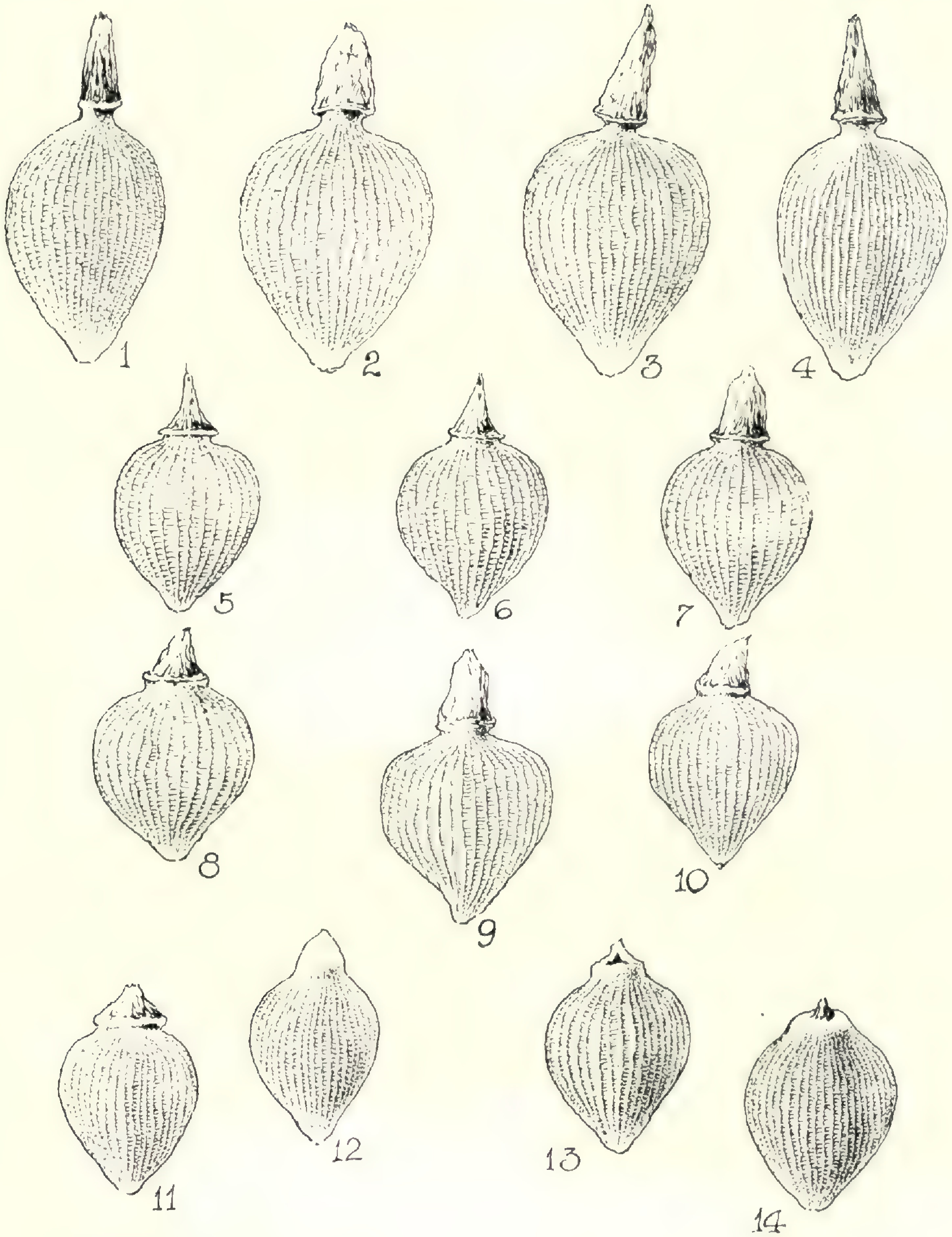

A. M. Johnson del.

ACHENES OF ELEOCHARIS.

Farlow Bot. Lab

Rhodora

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. April, 1925. No. 316.

NOTES ON THE FLORA OF BOOTHBAY, MAINE.

NORMAN C. FASSETT.

THE coast of Maine between Casco Bay and Penobscot Bay is cut into a series of long narrow peninsulas, separated by a series of fiord-like inlets, probably due to glacial erosion. The town of Boothbay, in Lincoln County, about twenty-five miles southeast of Bath, is at the southern, *i. e.*, the seaward, end of one of these peninsulas. The most southern part of the town consists of Linekin Neck, a piece of land three miles long and varying in width from a few rods to a mile. At the end of Linekin Neck is the summer colony of Ocean Point, and off Ocean Point lie several islands. A few of these may be mentioned in some detail.

A mile south of Ocean Point is Fisherman Island, a mile long and only a few rods wide, lying almost due north and south. It rises to a height of forty feet above sea level, and is used as a pasture for cattle. It is almost treeless, and records show that it has been so for at least two centuries.

A mile and a half south of Fisherman Island is Damiscove Island, which is a mile and a half long, with the same proportions and orientation as its neighbor to the north. Thirty years ago the northern end of Damiscove was wooded, but it is now bare, and used for sheep pasturage. At about the middle of the island there is a pond a quarter of a mile long, separated from the sea only by a narrow beach. The seaward end of this pond is somewhat brackish, but the landward end is a Sphagnum bog, with *Vaccinium macrocarpon, Eriophorum tenellum*, and *E. virginicum*. It is remarkable, however, that in this same bog grows *Juncus balticus*, var. *littoralis*. This pond, and other brackish pond-holes on the island, will probably yield several interesting species with thorough botanizing.

One mile east of Damiscove Island is Outer Heron Island, which is not settled, except for some cabins occasionally used by fishermen, and cattle are pastured upon it. This island is to a large extent wooded. A mile and a half to the southward is Pumpkin Island, a small green treeless dome rising forty feet above the waves.

A few species collected by the writer on this archipelago and on Ocean Point seem worth recording. Most of the plants are represented by specimens in the Herbarium of the New England Botanical Club; figures in parentheses refer to the collector's number on the sheets so filed.

Juniperus horizontalis Moench. Not common. One small shrub in an exposed field on Fisherman Island (260), one shrub in a similar situation on Outer Heron Island (258), and one in an open field half a mile from the shore at Ocean Point (259). Also reported from Pumpkin Island.[1]

Ruppia maritima L., var. longipes Hagström; Fernald & Wiegand, Rhodora xvi. 125 (1914). New to Lincoln County; not previously represented in the Herbarium of the New England Botanical Club between Mt. Desert and the Kennebec River. Occurs on Outer Heron Island (264) in a pool of brackish water perhaps two rods from the sea, and in a similar situation on Damiscove Island (407).

Triglochin palustris L. New to Lincoln County; previously not represented between Matinicus Island and Wells Beach. In the same pool as the preceding on Outer Heron Island (257), and on the shores of the pond on Damiscove Island (405).

Puccinellia maritima (Huds.) Parl.; Fernald & Weatherby, Rhodora xviii. 6 (1916). On a small patch of salt marsh, Ocean Point (412), and on Squirrel Island, a mile to the eastward. Previously not known in Maine east of Cumberland Foreside.

Carex umbellata Schkuhr. Ocean Point (233). New to Lincoln County.

Arceuthobium pusillum Peck. Abundant on *Picea canadensis* at Outer Heron Island (404) and Ocean Point. Usually confined to the border of the forest along the sea margin, controlled perhaps by moisture in the air.

Chenopodium album L. (413) and Sonchus oleraceus L. (2304). At Ocean Point these species grow on the cobblestone beach, where there is scarcely any soil, and make a luxurious development. *Cheno-*

[1] Norton, Rhodora xv. 138 (1913).

podium grows 1.5 meters high, and *Sonchus* attains a height of 2 meters. This is apparently due to the dilute salts from the ocean spray, and to the fertilizing effect of dead eel-grass and sea-weeds.

FRAGARIA VIRGINIANA Duchesne, var. TERRAE-NOVAE (Ryd.) Fernald & Wiegand. Occasional on Outer Heron Island (401), and at Ocean Point (430).

RUBUS ANDREWSIANUS Blanchard. Ocean Point (826). In Maine previously known only from Orono and from Rockport.[1]

RUBUS JACENS Blanchard. Ocean Point (499). Previously known in Maine only from York County, and approached by material from Oldtown.

COELOPLEURUM LUCIDUM (L.) Fernald, forma FRONDOSUM Fernald. Occasional at Ocean Point.

MERTENSIA MARITIMA (L.) S. F. Gray. Stony beach, Damiscove Island (409). In 1920 this species was growing in crevices in the rocks at Ocean Point; in 1923 I could not find it at this locality.

EUPATORIUM PERFOLIATUM L., forma **truncatum** (Muhl.) n. comb. *E. truncatum* Muhl. in Willd. Sp. Pl. iii. 1751 (1804). *E. salviaefolium* Sims, Bot. Mag. 2010 (1818). *E. perfoliatum*, var. *truncatum* Gray, Syn. Fl. N. Am. i. pt. 2: 99 (1884). Occurs occasionally with the typical form at Ocean Point.

EUPATORIUM PERFOLIATUM L., forma **trifolium**, n. f., foliis ternatis connatis sicut apud formam typicam vel liberis sicut apud formam *truncatum* saepe oppositis vel in ramis alternis.

Leaves in whorls of 3's, connate as in the typical form or distinct at the base as in forma *truncatum*, often opposite or alternate on the secondary axes.—QUEBEC: tidal shores of the St. Lawrence River, St. Augustin, August 7, 1923, *Svenson & Fassett*, no. 2051. MAINE: tidal shores of the Kennebec River, Bowdoinham, August 24, 1921, *N. C. Fassett*, no. 343; Ocean Point, September 8, 1921, *N. C. Fassett*, no. 346. MASSACHUSETTS: Needham, August 22, 1886, *Ella M. Fuller* (TYPE in Herb. New England Botanical Club).

Professor J. F. Collins records having found this form,[2] saying: "The leaves of each whorl were united about the stem much as in the usual form, except that there was a superfluity of tissue at the points of contact, thus making the bases of the leaves crispate." This is often the case, although the leaves are sometimes free from each other at the base.

[1] C. A. E. Long, RHODORA, xxiv. 181 (1922).
[2] Bot. Gaz. xi. 341 (1886).

In a clump of *E. perfoliatum* growing on the estuary of the Kennebec River, there were several stems arising in one clump; one was forma *trifolium*, a second had five solitary leaves, one set of two leaves at an angle of 120 degrees, and five pairs of opposite leaves, while the rest of the stems in this clump bore normal foliage. Near the specimen collected at Ocean Point was an individual which had the leaves alternate, connected by a broad wing spiraling about the stem.

Aster longifolius Lam., var. villicaulis Gray. A few plants in a thicket at Ocean Point (429). This appears to be the first collection in Maine on the coast.

Bidens frondosa L., var. anomala Porter. Abundant at Ocean Point along the shore, on cobblestone beaches or in crevices in the rocks. Also at Squirrel Island (408) where it is sometimes found with the typical form of the species. Previously reported in Maine only on the tidal reaches of the Androscoggin River. I have seen it on rocky shores bordering salt water at Woolwich.

Graduate School of Arts and Sciences, *Harvard University*.

FOURTH REPORT OF THE COMMITTEE ON FLORAL AREAS.

Our previous reports (Rhodora xx. 181–185, 193–197; xxii. 80–89; xxiii. 209–220) have dealt with pteridophytes and with a family of flowering plants, the *Ranunculaceae*, most of the New England members of which are spring-flowering, woodland species. It was felt that, this time, it might be of interest to consider a group of summer- and fall-flowering plants; and the early genera of the *Compositae*, through *Solidago*, were accordingly chosen.

In nomenclature, we have followed Prof. Wiegand's revision of the verticillate *Eupatoria*. We have taken up the earlier names *Solidago suaveolens* and *S. humilis* in place of *S. odora* and *S. uliginosa*, and, following Prof. Fernald, have treated *S. aspera* and *S. neglecta* of the Manual as varieties of *S. rugosa* and *S. uniligulata* respectively. One minor variety has been reduced to formal rank (following Mr. Fassett) and four (*Solidago Randii*, var. *monticola*, *S. juncea*, var. *scabrella*, and the two varieties of *S. caesia*) have been omitted altogether as hardly deserving of any recognition. Otherwise, the Manual names stand unchanged—plus species and varieties recognized or detected within our area since 1908. As before, varieties which

show no distinctive ranges are omitted from the geographic treatment.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS—XXIX.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a reliable printed record has been found.]

COMPOSITAE. I. VERNONIEAE	Me.	N. H.	Vt.	Mass.	R. I.	Conn
Vernonia noveboracensis Willd.				+	+	+
II. EUPATORIEAE.						
Eupatorium aromaticum L.				+	+	+
" falcatum Michx.		+	+	+	+	+
" hyssopifolium L.				+	+	+
" leucolepis T. & G.				+	+	
" maculatum L.	+	+	+	+		+
" " var. foliosum (Fernald) Wiegand	+	+	—			
" perfoliatum L.	+	+	+	+	+	+
" " f. purpureum Britton	+			+		
" perfoliatum f. truncatum (Muhl.) Fassett[1]			+	+	+	—
" pubescens Muhl.	+	—		+	+	+
" purpureum L.	+			+	+	+
" rotundifolium L.				+	—	
" sessilifolium L.		+	+	+	+	+
" urticaefolium Reichard	+	+	+	+	+	+
" verbenaefolium Michx.		—		+	+	+
" verticillatum Lam.	+	+	+	+	+	+
Liatris pycnostachya Michx.				+		
" scariosa Willd.	+	+		+	+	+
" spicata (L.) Willd.				+		
Mikania scandens (L.) Willd.	+	—		+	+	+
Sclerolepis uniflora (Walt.) BSP.		+		+	+	
III. ASTEREAE.						
Chrysopsis falcata (Pursh) Ell.				+	+	+
Grindelia lanceolata Nutt.						—
" robusta Nutt.				+		
" squarrosa (Pursh) Dunal	+	+		+	+	+
Solidago altissima L.	+	+	+	+	+	+
" arguta Ait.	+	+	+	+	+	+
" × asperula Desf.	+	+		+	+	+
" bicolor L.	+	+	+	+	+	+

[1] See RHODORA xxvii, 55.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Solidago caesia L.	+	+	+	+	+	+
" calcicola Fernald	+					
" canadensis L.	+	+	+	+		+
" " var. gilvo-canescens Rydb.			+			
" canadensis var. Hargeri Fernald			+	+		+
" Cutleri Fernald	+	+	+			
" Elliottii T. & G.				+	+	+
" " var. divaricata Fernald					+	
" erecta Pursh				+		
" graminifolia (L.) Salisb.	+	+	+	+	+	
" " var. Nuttallii (Greene) Fernald	+	+	+	+	+	+
" hispida Muhl.	+	+	+	+		+
" humilis Pursh	+	+	+	+		+
" juncea Ait.	+	+	+	+	+	+
" latifolia L.	+	+	+	+	+	+
" lepida DC., var. fallax Fernald	+					
" lepida DC., var. molina Fernald	+					
" macrophylla Pursh	+	+	+	+		
" " var. thyrsoidea (E. Mey.) Fernald	+	+				
" minor (Michx.) Fernald				—		
" nemoralis Ait.	+	+	+	+	+	+
" " var. arenicola Burgess					+	
" patula Muhl.		—	+	+		+
" puberula Nutt.	+	+	+	+	+	+
" racemosa Greene	+	+	+			
" " f. leucantha Fernald		+				
" Randii (Porter) Britton	+	+	+	+		
" rigida L.				+	+	+
" rugosa Mill.	+	+	+	+	+	+
" " var. aspera (Ait.) Fernald	+	+		+	+	+
" rugosa var. sphagnophila Graves	+			+	+	+
" rugosa var. villosa (Pursh) Fernald	+	+	+	+	+	+
" sempervirens L.	+	+		+	+	+
" serotina Ait.	+	+	+	+	+	+

Solidago serotina, var. gigantea (Ait.) " Gray	+	+	+	+	+	+
" speciosa Nutt.		—		+	+	+
" squarrosa Muhl.	+	+	+	+		+
" suaveolens Schoepf		+	+	+	+	+
" tenuifolia Pursh	+	+		+	+	+
" ulmifolia Muhl.	+	—	+	+	+	+
" uniligulata (DC.) Porter	+	+	+	+	+	+
" " var. neglecta (T. & G.) Fernald.	+	+	+	+	+	+

Of the five introduced species in this list, none is well established in New England, and none of them may, at present, survive at any given locality.

Liatris spicata is a waif, reported once at Lawrence, Mass.; *L. pycnostachya* has been collected on a dump at Dorchester, Mass.

Grindelia squarrosa is an occasional weed in waste places; *G. robusta* was once found at Lowell, Mass.; *G. lanceolata* is reported from Greenwich, Conn.

Geographically, the genera here considered show a large proportion of southern species and a number of ranges which fit with some difficulty into the groups hitherto recognized by us. In order better to accomodate them, one of these groups has been changed; an area called "northern Maine" is, in this report, used in place of the "upper St. John" of the third report. It includes most of the state north of the 45th parallel of latitude. In a general way, this parallel may be said to lie along the southern border of the spruce forest, at least in the western half or two-thirds of the state, and so indicates a natural limit to the northward extension of many southern species. In the Penobscot basin, however, some of these species work further north in the strip of hardwood forest already referred to in these reports (RHODORA xxiii. 215); here the boundary of our area may have to be carried northward to an extent not yet definitely determined. "Cape Cod" of our third report we are now calling "southeastern Massachusetts" (a term more elastic and less likely to be misunderstood than the perhaps too definite "Cape Cod"), but without present change of boundaries. Finally, a third area, "southeastern Maine," here receives more attention than formerly. It comprises the corner of the state bounded by a line running from the coast west

of the mouth of the Union River roughly along the watershed of the Penobscot drainage basin to the St. Croix at about the northern boundary of Washington County. It includes all of this county and part of Hancock Co. It is well known for the occurrence on the cold headlands and islands along the coast of a little group of northern species not found elsewhere in New England. Inland it is for the most part a country of sterile soils; probably for that reason, it lacks a good many species otherwise of rather general distribution in southern and central Maine and even throughout the rest of the state. Species marked with an asterisk in groups I, II, III, V, and VI following are not known from southeastern Maine.

I. Generally Distributed.

Eupatorium perfoliatum	Solidago graminifolia, var. Nuttallii
Solidago canadensis	" juncea*

Solidago rugosa

Solidago canadensis has not been reported from Rhode Island, though occurring east and west of it, and in general becomes distinctly rarer in southern New England.

II. Generally distributed except in southeastern Massachusetts.

Eupatorium urticaefolium*	Solidago latifolia

Solidago serotina*

Eupatorium urticaefolium is, curiously, known from Rhode Island only as an escape from cultivation. The only records of *Solidago serotina* from northern Maine which we have rest on collectors' notes, not on specimens; its position in this group is, therefore, somewhat uncertain.

III. Neither northern Maine nor southeastern Massachusetts, rather general elsewhere.

Solidago arguta*

This species is rare in Maine and, except for its absence from southeastern Massachusetts, would go as well in group VI.

IV. Alpine.

Solidago Cutleri

Solidago macrophylla, var. thyrsoidea

This is the first time we have had to deal with strictly alpine plants in these reports; it may therefore be worth while to give the location of the small alpine areas of New England. They consist of the summit of Mt. Katahdin and the highest summits of the mountains of western Maine (Franklin and Oxford Counties), of the White, and of the Green Mountains. *Solidago Cutleri* is found in all four regions; *S. macrophylla,* var. *thyrsoidea* only on Mt. Katahdin and the White Mts.

V. Northern.

A.

Eupatorium maculatum

Solidago rugosa, var. villosa

Solidago squarrosa*

B.

Eupatorium maculatum, var. foliosum

Solidago lepida, var. fallax

Solidago lepida, var. molina

" macrophylla

Solidago Randii

Solidago squarrosa is peculiar in that it shows, in the southern part of its New England range, an apparent preference for calcareous habitats, being found in Connecticut only on trap and limestone ridges. Further north it exhibits no such peculiarity. The two varieties of *Solidago lepida,* described by Prof. Fernald in Rhodora xvii. 9 (1915), are very rare in our area. The former was found by Robinson and Fernald in 1901 at Ft. Fairfield, Aroostook, Co., Maine, and in 1917 was discovered by Nathaniel T. Kidder on Nathan's Island, near Isle au Haut in Penobscot Bay (Rhodora xx. 77–78 (1920). The latter was also found by Mr. Kidder on the neighboring York Island. *S. macrophylla* and *S. Randii* inhabit chiefly the hilly regions of the north, though the former reaches sea-level in Washington Co., Maine, and the latter occurs on some of the islands along the Maine coast.

VI. Southeastern Massachusetts and rather general elsewhere, but not northern Maine.

Solidago caesia*	Solidago nemoralis
" bicolor	" puberula
Solidago serotina, var. gigantea*	

Solidago bicolor has been collected on the east branch of the Penobscot at about the 46th parallel, and *S. puberula* in the lower Mattawamkeag valley. *S. caesia* and *S. serotina*, var. *gigantea* are of more southern range than the others of this group. The former is not known in Maine east of the Penobscot valley, and the latter is placed in this group rather than the following only because it follows the valley of the Androscoggin into the White Mt. region, occurs in central New Hampshire, and is found on Mt. Desert Island.

VII. Chiefly the three southern States.

Mikania scandens‡	Eupatorium verticillatum‡
Vernonia noveboracensis†‡	Liatris scariosa‡
Eupatorium aromaticum‡	Solidago altissima
" falcatum†	" erecta‡
" pubescens‡	" rugosa, var. aspera‡
" purpureum	" speciosa†
" rotundifolium†‡	" suaveolens
" sessilifolium†	" ulmifolia
" verbenaefolium‡	" uniligulata, var. neglecta

The species marked with a dagger do not occur in southeastern Massachusetts; those marked with a double dagger are not known to us from Massachusetts west of the Connecticut valley. *Eupatorium rotundifolium* is exceedingly rare; we have seen specimens from Georgetown and Framingham, Mass., and Gray's Manual reports it from Rhode Island. The Manual record for *Solidago altissima* in Aroostook Co., Maine, was based on specimens later determined as *S. lepida*, var. *fallax*. This species occurs, however, at Falmouth and Brunswick in southwestern Maine and works its way north in the Connecticut and Passumpsic valleys to Caledonia Co., Vermont, and in the Champlain Valley, where it is frequent or even locally abundant, to the Canada line. *S. uniligulata*, var. *neglecta* extends north in western Vermont at least as far as Fairhaven and on the

Maine coast east to the region of Penobscot Bay. The ranges of these two plants, with that of *S. serotina*, var. *gigantea*, connect this group with the preceding. In the geographic, as in the taxonomic, classification of plants it is often impossible to draw exact lines of demarcation between groups. These essentially southern plants, though definitely avoiding the region of Canadian forest, show very various degrees of tolerance of severe climatic conditions, where they find otherwise favorable environment.

Solidago erecta, though known in our area only from a single station at Brewster on Cape Cod (Fernald), occurs there in dry woods on clay and gravel and seems to be in its southern range a plant of woods and hillsides of the Alleghanies rather than of the coastal plain; it is therefore placed in this group rather than the following.

VIII. Coastal Plain.

Chrysopsis falcata
Eupatorium hyssopifolium
" leucolepis
Solidago Elliottii
Solidago Elliottii,
var. divaricata
" minor
" rugosa, var. sphagnophila
" tenuifolia

Solidago tenuifolia is found as far north and as far from the coast as Carroll Co., New Hampshire, and Limington, Maine. It follows the Naugatuck and Connecticut valleys inland, in the latter case as far as the sand-plains about Springfield, Mass.

Eupatorium leucolepis is known only from Kingston and Lakeville, Mass., and from Kingston, R. I. *Solidago Elliottii*, var. *divaricata* is known only from the type station on Block Island (Fernald, Long, and Torrey). *S. minor* is reported in Bicknell's "Flowering Plants and Ferns of Nantucket."

IX. Calcicolous Species.

Solidago calcicola
" canadensis,
var. Hargeri
Solidago hispida
" racemosa
Solidago humilis

Solidago canadensis, var. *Hargeri*, is known only from central and western Connecticut and western Massachusetts and Vermont. Our only locality for *S. calcicola* is Limestone, Maine (Fernald). *S.*

racemosa grows in the crevices of slate and limestone ledges at scattered stations in the three northern states.

There is a pale yellow color-form of *S. bicolor* and a hybrid of this species with *S. puberula.* Some at least of the reports of *S. hispida* in southern New England are probably due to confusion with one or the other of these plants. *S. humilis* (as *S. uliginosa*) is reported in Dame & Collins, Fl. Middlesex Co., 49 (1888), as growing in peat-bogs at Concord, Mass. It is also reported from the Great Swamp of southern Rhode Island by E. S. Reynolds, in Rhodora ix. 117 (1907). As specimens are not available, and as individuals of *S. uniligulata,* var. *neglecta* with poorly developed inflorescence have often been mistaken for *S. humilis,* these reports have been omitted from our consideration as doubtful.

X. Western New England only.

Solidago patula Solidago rigida

Solidago patula, which flourishes in swamps in the calcareous areas of western Massachusetts and Vermont, as far north as Rutland Co., is by no means calcicolous in Connecticut, where it is well distributed as far east as the Connecticut Valley, with outlying stations in New London and Tolland Counties, and apparently pays no attention to the presence or absence of lime in the soil. It is reported from Manchester, N. H., in Batchelder's Flora, and from "western Maine" in the Manual, but these reports we have been unable either to verify or disprove.

S. rigida was once found as a waif (two plants only) in Framingham, Mass. It is abundant in several places on the western shore of Narragansett Bay in Rhode Island. It has been found at South Hadley and Sheffield in western Massachusetts and is occasional in southwestern Connecticut, with scattered stations eastward.

XI. Maritime Species.

Solidago asperula Solidago sempervirens

XII. Miscellaneous.

Solidago graminifolia Sclerolepis uniflora
Solidago uniligulata

The smooth-pedicelled *Solidago graminifolia*, as distinguished from the var. *Nuttallii* with hirtellous inflorescence, is a rare form, occurring at scattered stations in various parts of New England, except Connecticut. *Sclerolepis uniflora* is known only from a pond in Bradford, N. H., and from one on the boundary line between Massachusetts and Rhode Island. *Solidago uniligulata* has a rather distinctive range, which is not quite matched by any we have yet mapped, and which dovetails almost perfectly into the typical range of group IX. The calcicolous species of that group occur, in southern New England, almost wholly west of the Connecticut River; in the north they spread eastward through the calcareous areas of northern New Hampshire and central and northern Maine. *S. uniligulata*, a species of strongly acid meadow-bogs, is found, in southern New England, almost wholly east of the Connecticut and northward is almost confined to a belt about fifty miles wide along the Maine coast.

C. H. Knowlton
C. A. Weatherby
W. S. Ripley.

THE GENUS ERYSIMUM.

K. K. Mackenzie.

The description of Erysimum by Linnaeus in the fifth edition of the Genera Plantarum (p. 296) published in 1754 is as follows:

"729 ERYSIMUM* *Tournef*. 111.

"Cal. *Perianthium* tetraphyllum: *foliolis* ovato-oblongis, conniventibus, coloratis, deciduis.

"Cor. tetrapetala, cruciformis. *Petala* oblonga, plana, apice obtusissima: *unguibus* longitudine calycis, erectis.

"*Nectarifera* glandula duplex intra filamentum brevius.

"Stam. *Filamenta* sex, longitudine calycis: quorum *duo opposita* breviora. *Antherae* simplices.

"Pist. *Germen* lineare, tetragonum, longitudine staminum. *Stylus* brevissimus. *Stigma* capitatum, persistens, parvum.

"Per. *Siliqua* longa, linearis, stricta, tetragona, bivalvis, bilocularis.

"Sem. plurima, parva, subrotunda."

In the first edition of the Species Plantarum (p. 660) published in 1753 Linnaeus gave four species as follows: (1) *officinale;* (2) *Barbarea;* (3) *Alliaria;* (4) *cheiranthoides.*

Both the description quoted from the Genera Plantarum and the treatment in the Species Plantarum follow earlier works published by him before his introduction of the binomial system of nomenclature.

All recent authors refer the four species given under Erysimum by Linnaeus to four different genera. Tournefort had a very similar view, as he referred species No. 1 to *Erysimum;* No. 2 to *Sisymbrium;* No. 3 to *Hesperis;* No. 4 to *Turriis.*

The name Erysimum is a very old one for cruciferous plants and appears in most of the old works I believe. Very few if any of the earlier authors used the name without figuring or citing as *Erysimum* the plant we now know as *Erysimum officinale.* It is so figured for example by Pena & Lobel p. 69 (1570); Lobel Stirp. Icon. 206 (1581); Dodonaeus Pemptades 714 (1616); Parkinson Theat. Bot. 833 (1640); Morison Hist. Univ. p. 218 and tab. 3 sect. 3 f. 1 (1680). It is certainly to be regarded as the historic type of *Erysimum,* if the plant by far most generally considered as *Erysimum* is to be so regarded.

The first scientist to deal with *Erysimum* after 1753 as far as I know was Miller in 1754 (Gard. Dict. Abr. Ed. 4). He put five species in the genus. His first species is the same as the first species of Linnaeus (*E. officinale*). He treated as belonging to the genus *Erysimum* the plants treated by Linnaeus as *Sisymbrium Irio, S. polyceratium* and *S. Sophia.* In other words his conception of *Erysimum* is very much the same as the conception of *Sisymbrium* as given in Gray's Manual 7th edition.

Miller dealt with the other species placed by Linnaeus in *Erysimum* as follows:

He referred species No. 2 (*Barbarea*) to *Sisymbrium.*

He referred species No. 3 (*Alliaria*) to *Hesperis.*

He referred species No. 4 (*cheiranthoides*) to *Turritis* (Turritis leucoii folio).

Under the American Code of nomenclature the name *Erysimum* undoubtedly must be used for a group of plants to which *Erysimum officinale* is referred. In other words that species is the type of the genus.

The International Code of nomenclature requires that on the division of a genus "if the genus contains a section or some other division which judging by its name or its species, is the type or the origin of the group the name is reserved for that part of it." (Art. 45.) It also provides that in the case of the union of two groups of the same date a selection of a name for the combined group is to be made by the author first making the union, and that his choice cannot be changed by subsequent authors. Applying the first rule above referred to one would say that in view of Tournefort's plate cited by Linneaus and the long pre-Linnaean use of *Erysimum* for *E. officinale*, the International Code requires the use of the name *Erysimum* in the same way as does the American Code. Applying to breaking up a genus the same rule as the International Code applies to the union of two genera one would say that the International Code (if other provisions are not applicable) plainly requires us to follow what Miller did and apply the name *Erysimum* to *E. officinale*.

Under neither system of nomenclature is the use of *Erysimum* as it is used in Gray's Manual justified.

Maplewood, New Jersey.

NOTES ON DISTICHLIS.

Norman C. Fassett.

Many recent writers[1] have treated *Distichlis spicata* as a species of wide range on both coasts of North America and in alkaline places inland. Rydberg,[2] on the other hand, has treated the genus as having two species in the Rocky Mountains, *D. stricta* (Torr.) Rydb. and *D. dentata* Rydb., both distinct from the eastern *D. spicata*.

Careful examination of many collections of *Distichlis* has convinced the writer that *D. spicata*, common along the Atlantic Coast of North America, is on the Pacific Coast restricted to the region of Puget Sound, and that the plant generally distributed on the western coast and in the Rocky Mountains is a distinct species, *D. stricta*. This latter plant is of broad range, is polymorphic, and probably consists of a number of varieties.

[1] Hitchcock in Gray, Manual, ed. 7: 153–4 (1908); Britton & Brown, Ill. Fl. ed. 2: i. 250 (1913); Abrams, Ill. Fl. Pacific States i. 194 (1923); Small, Fl. Southeastern U. S., ed. 2: 152 (1913); Coulter & Nelson, New Man. Bot. Central Rocky Mts. 68 (1909).

[2] Rydberg, Fl. Rocky Mts., ed. 2: 72 (1923).

The compact panicles of *D. spicata* have from 10 to 20 spikelets, of which the pistillate are slightly firmer than are the staminate; these spikelets are rarely more than a centimeter in length. *D. stricta* has more open panicles, with 16 to 24 spikelets, which are from 1.2 to 2.5 cm. in length, firm and coriaceous in the pistillate plants, and papery in the staminate. The spikelets of *D. spicata* are from 4- to 9-, rarely 12-flowered, with lemmas rarely exceeding 3.6 mm. in length, while the 6- to 18-flowered spikelets of *D. stritca* have lemmas varying in length from 4.5 to 7.8 mm., except in a few plants, probably varietally distinct, which have lemmas ranging from 3.2 to 5 mm. in length. The grain of *D. spicata* is about 2 mm. long, ovoid, and not much narrowed below the two beak-like styles, while that of *D. stricta* is 2.5 to 5 mm. long, narrowed to an attenuate style, which is sometimes split, but hardly into two distinct styles as in *D. spicata.* The leaves of *D. spicata* are smooth-edged and blunt or oblique at the tip, while those of *D. stricta* are sharp-pointed and serrate at the tip. Specimens from the coasts of Washington, Oregon, and northern California have obscurely serrate leaf-tips and a grain only 2 mm. long, but otherwise resemble *D. stricta;* they probably constitute a variety of this species.

D. dentata Rydberg was described as differing from *D. spicata* and *D. stricta* in having broader leaves, spikelets, glumes and paleas, and dentate keels on the paleas. In all these characters *D. stricta* is extremely variable, and while the conspicuously dentate paleas appear at first to be distinctive, this character breaks down when it is seen that almost all of the plants have the lemmas somewhat dentate, and that there is a difference only of degree.

The synonymy, characters, and ranges of *D. spicata* and *D. stricta* may be thus summarized:

Distichlis spicata (L.) Greene, Bull. Cal. Acad. Sci. ii. 415 (1887), as to combination, not as to plant. *Uniola spicta* L. Sp. Pl. 71 (1753), as to plant, not as to Clayton synonym. *U. distichophylla* Roem. & Schult. Syst. ii. 596 (1817), not Labillardière, Nov. Holl. Pl. Spec. i. 21. t. 24 (1804). *Briza spicata* Lam. Enc. Meth. i. 465 (1783), not Sibthorp, Fl. Graeca i. 60 (1806). *Festuca triticoides* Lam. Ill. des Genres 191 (1791). *F. distichiphylla* Michx. Fl. Bor.-Am. i. 67 (1803); Pursh, Fl. Am. Sept. i. 84 (1814). *Distichlis maritima* Raf. Journ. Phys. lxxxix. 104 (1819). *D. nodosa* Raf. l. c. *Brizopyrum americanum* Link, Hort. Berol. i. 160 (1827). *B. spicatum* Hook. & Arn. Bot. Beech. 403 (1841). *Poa Michauxii* Kunth, Rev. Gram. i. 111 (1829) and ii. 533. t. 181 (1832), and Enum. i. 325 (1833).—Plants

1.5–4 dm. tall: leaves 5–15 cm. long, spreading or ascending, flat to involute, smooth on edge and tip (very rarely with a few scattered serrations toward the tip); tips bluntish, obtuse, or oblique; ligule a ring of very short hairs, rarely with a sparse tuft of silky hairs coming from the mouth of the sheath: panicles with 10–20 spikelets, cylindric, compact: spikelets 5–10(–14) mm. long, soft, the pistillate a little firmer than the staminate: first glume (0.4–)2–3.5 mm. long; second glume 2.5–4 mm. long; lemma 3.5 (–3.6) mm. long, the pistillate with a slightly differentiated hyaline margin, the staminate papery throughout; palea 3–4.5 mm. long, hyaline, firmer on the keels, which are minutely ciliolate; grain reaching 2 mm. in length, with two styles on the hardly narrowed top, not truly beaked; rudiments of the stamens minute in pistillate plants, the anthers represented by globular or sagittate heads; anthers 2–3 mm. long; the rudiments of the pistil very rarely present in staminate plants.—Salt marshes, Prince Edward Island to Florida; West Indies; Vancouver Island; South America; perhaps in western Texas.[1]

D. stricta (Torr.) Rydb. Bull. Torr. Bot. Cl. xxxii. 602 (1905). *Uniola stricta* Torr. Ann. N. Y. Lyc. i. 155 (1824). *U. multiflora* Nutt. Trans. Am. Philos. Soc. v. 148 (1837). *U. (Brizopyrum) flexuosa* Buckley, Proc. Acad. Nat. Sci. Phila. 1862, 99 (1862). *Distichlis maritima*, var. *stricta* Thurb. in Wats. Bot. Cal. ii. 306 (1880). *D. spicata* (L.) Greene, Bull. Cal. Acad. Sci. ii. 415 (1887). *D. spicata stricta* Scribn. Mem. Torr. Bot. Cl. v. 51 (1894). *D. dentata* Rydb. Bull. Torr. Bot. Cl. xxxvi. 536 (1909).—Plants 1–5.5 dm. high: leaves 2–15 cm. long, strongly ascending or somewhat spreading, flat or loosely involute, stiff or flexuous, usually strongly serrate on the edges and sharply pointed tips, often pubescent on the inner surface; ligules often with a copious tuft of hairs coming from the mouth of the sheath: panicle with 16–24 spikelets (except in some plants of the interior, probably varietally distinct, with 4–10 spikelets), long-cylindric, rather more open than that of *D. spicata:* spikelets 9–25 mm. long, 6–18-flowered, the pistillate hard and coriaceous, the staminate much softer; first glume 3.2–7.8 mm. long; second glume (2.1–)3–7 mm. long; lemma (3.2–)4–7.8 mm. long, the pistillate with a conspicuous, often broad and torn, hyaline margin; palea (2.4–)3–5.4 mm. long, the keels of the pistillate often ciliate, or even winged and dentate; grain (2–)3–5 mm. long at maturity, tapering to a beak, which is often notched or split; staminate rudiments minute in pistillate plants, the anther represented by a clavate, sagittate, or forked head; stamens 2–4 mm. long; rudiment of pistil present or absent in staminate plants.

[1] Sheets in the Gray Herbarium are labelled: "Collected in Expedition from Western Texas to El Paso, New Mexico, May–October, by Charles Wright, no. 783." Wright's records say of this number: "San Pedros, Devil's River, Declivity of hills; flowers purplish." The last two words certainly do not refer to the specimens in question, and the following note, bracketed from numbers 777 to 802, suggest that the labels may have become mixed:—"Some of these were spoiled during my sickness and thrown away."

—British Columbia and Saskatchewan to Arizona, New Mexico, and Oklahoma, and westward to the Pacific Ocean; introduced about railroad yards in Sheffield and Kansas City, Missouri. A very variable species in size, habit, and technical characters.

D. Palmeri (Vasey) Fassett in Johnston, Proc. Cal. Acad. Sci. ser. 4: xii. 984 (1924). *Uniola Palmeri* Vasey, Gard. & For. ii. 401. f. 124 (1899).—"Culms wiry and rigid, sometimes cane-like, two to four feet high, from subterranean root-stocks, often much branched, and many culms from one root, leafy to the top. Leaves distichous, (sometimes less than an inch apart, sometimes two to four inches apart), smooth, rigid, erect, involute, with a long, pungent apex, the lower two to four inches, the upper four to nine niches long and exceeding the panicle." Pistillate panicles much exceeded by the leaves, staminate plants with one or two leaves barely reaching the end of the panicle.[1] Ligule a very short collar-like ring of hairs, with a woolly tuft of hairs at the angles. "Raceme of the staminate plants six to nine inches long, narrow, the branches mostly in two's or three's, the lower ones one to three inches long, erect, compound below . . . Racemes of the fertile plant shorter, thicker and more condensed, being four to six inches long, and the branches sessile or short-stalked." Pistillate spikelets 2.5–3.5 cm. long, firm, with one or two empty lemmas; first glume 10 mm. long; second glume 12 mm. long; lemma 15 mm. long; palea 10 mm. long; grain plump, beaked, nearly 1 cm. long; staminate rudiments very minute in pistillate plants, 0.2 mm. long, apparently representing the filaments only; staminate spikelets 2 cm. long, less firm and narrower than the pistillate, without empty lemmas; anthers 4–5 mm. long; pistillate rudiment wanting in staminate plants.[2]—Salt marshes about the Gulf of California. Mexico: Horseshoe Bend, Sonora, April, 1889, *Dr. E. Palmer*, no. 924, 929; Head of Gulf of California, 1889, *Palmer;* Las Animas Bay, Lower California, May 8, 1921, *I. M. Johnston*, no. 3490.

Dr. Vasey says of this plant: "Its general appearance is that of a Distichlis, from which it differs in having four of the lower glumes (instead of two only) in each spikelet empty, i. e., without palet or flower, and in the disarticulation of the rachis between the spikelets of both sexes—that is, the spikelets break apart between the several flowers when mature. This disarticulation occurs also to some extent in the fertile spikelets of Distichlis, but not in the male or infertile ones. On the other hand it differs from Uniola in its dioecious character, and here it agrees with Distichlis."

The pistillate spikelets are coriaceous, while the staminate are soft and papery; the pistillate panicles are greatly over-topped by

[1] This type of sexual dimorphism is exhibited to some extent by all species of *Distichlis*.

[2] Description quoted in part from Vasey, l. c.

the leaves, while the staminate are short-exserted, as is usually the case in *Distichlis;* the pistillate spikelets have one or two empty lemmas as in *Uniola,* but the staminate spikelets are those of a *Distichlis:* these characters place this species unquestionably with the latter genus.

In regard to the anatomical characters of this grass, Holm says: "While engaged in studying the leaf-structure of *Uniola Palmeri* Vasey, I was well aware of the great similarity that exists between this species and the genus Distichlis in external characters of the inflorescence, the rhizome, and the rigid, densely 2-ranked, involute leaves. Now having examined the anatomy of the leaf in a number of species of Distichlis, the similarity between these two plants has been found to be so striking that it seems most natural to consider Uniola Palmeri as a true Distichlis. Professor F. Lamson-Scribner has informed me that on seeing the plant he immediately took it for a Distichlis and was unable to distinguish it from that genus."[1]

The large plump grains of this grass are eaten by the Indians, and Vasey gives an interesting account of their methods of gathering and preparing this food.

Distichlis **distichophylla** (Labill.) comb. nov. *Uniola distichophylla* Labillardière, Nov. Holl. Pl. Sp. i. 21. t. 24 (1804), not Roem. & Schult. Syst. ii. 596 (1817). *Poa distichophylla* R. Br. Prod. Fl. Nov. Holl. i. 182 (1810); Kunth, Enum. Pl. i. 325 (1833). *P. paradoxa* Roem. & Schult. Syst. ii. 569 (1817). *Festuca distichophylla* Hook. fil. Fl. Tas. ii. 127 (1858); F. Muel. Frag. Phyt. Austral. viii. 129 (1872–4); not *F. distichiphylla* Michx. Fl. Am.-Bor. i. 67 (1803); nor Pursh, Fl. Am. Sept. i. 84 (1814). *Distichlis maritima* Benth. Fl. Austral. vii. 637 (1878); not Raf. Journ. Phys. lxxxix. 104 (1819).

This species is only 1–2 dm. in height; the panicles have only 3–5 spikelets, which are 11–17 mm. in length; the grain is long-beaked, and is exceeded in length by the slender rudiments of the stamens; the leaves are 2–6 cm. in length, and closely spaced; the leaf-tips are long, slender, subulate, and very sharp, free from striations for a distance of from 0.5 to 1 mm. below the apex. *D. spicata,* on the other hand, attains a height of 4 dm.; the panicles have 10–20 spikelets, each only 5–10 mm. long; the grain is not beaked, but has two distinct styles, while the rudiments of the stamens are minute and much shorter than the body of the grain; the leaves are from 5–15 cm. in length, and are not as closely spaced as in *D. distichophylla;*

[1] Holm, Bot. Gaz. xvi. 275 (1891).

the leaf-tips are obtusish or oblique, and the striations of the leaf run to within 0.4 mm. of the apex. The low habit and few large spikelets make *D. distichophylla* of quite different appearance from *D. spicata.*

This plant is well illustrated by Labillardière, who shows a pistillate plant. A dissected floret is shown, however, with both pistil and well-developed stamens, a condition which does not obtain in nature.

D. distichophylla is reported from the coasts of South Australia, Victoria, Tasmania, and on the north coast of Queensland, also inland in saline places in the Grampian Mountains, Victoria.

Graduate School of Arts and Sciences, *Harvard University.*

The date of the March issue (unpublished as this goes to press) will be announced later.

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. May, 1925. No. 317.

EDWARD BLANCHARD CHAMBERLAIN.

Clarence H. Knowlton.

Edward Blanchard Chamberlain, son of Charles Edwin and Margaret J. (Blanchard) Chamberlain, was born in Bristol, Maine, July 24, 1878. Here his father was postmaster and proprietor of the village store. Both parents had been teachers, and he received most of his early education at home, where his attention was often turned to the interesting things of the natural world around them. He prepared for college at Lincoln Academy, Newcastle, Maine, where the principal, J. E. Dinsmore, was a stimulating amateur botanist.

Mr. Chamberlain entered Bowdoin College in the fall of 1895, following in the footsteps of his father, who was graduated there in 1868. He became a member of the Delta Kappa Epsilon fraternity. He was much influenced by Prof. Leslie A. Lee, an old-time all-around scientist, and took most of the scientific courses offered by the college. At graduation in 1899 he led his class, and became a member of Phi Beta Kappa. He then went to Brown University for two years as a graduate student and instructor in botany, receiving his degree of A. M. there in 1901. As his father had died during his college course, his mother went with him to Providence for these two years. Later she made her home among her own people at Cumberland Center, Maine.

The life work which Mr. Chamberlain entered upon was teaching in secondary schools. His first position, for one year only, was at Oak Grove Seminary, Vassalboro, Maine. He taught in the University School (for boys) in Washington, D. C., from 1902 to 1906; since then he has been a teacher in the Franklin School (for boys)

in New York City, where he taught till three days before his death. His teaching was mainly college preparatory science and mathematics, and he was very successful in it. He was also a strong man in the organization of the school, becoming senior master, "a most self-sacrificing and devoted member of its teaching staff," as one of his associates wrote of him. In recent years he has served as a reader in mathematics for the College Entrance Examination Board.

After the death of his parents Mr. Chamberlain made his summer home with his cousin, Mr. Henry H. Chamberlain, at Round Pond (Bristol), Maine. Here he lived a most lively existence, lending an active hand about the farm work, and building up his health and strength for the winter months in the city. He was most systematic in planning his life from day to day, and most conscientious in attention to details.

He was one of the original members of the Josselyn Botanical Society of Maine, and for many years he was an officer and an attendant at its meetings. To have known "Ed" on a field excursion was to have known him at his very best. Enthusiastic and a keen observer, he plunged into collecting with all the zest in the world, but he also seemed to feel a responsibility for the others in the party, and constantly went out of his way to assure himself that they were enjoying the trip, and getting their full share of its pleasures. He was most helpful with beginners, showing them what they needed to know, and helping them by word and letter. Withal he was a most cheerful individual on such occasions, mocking at the inconveniences of travel and hostelry, and keeping everyone interested by his characteristic comments.

Mr. Chamberlain became a non-resident member of the New England Botanical Club in 1898. He was a member of the Vermont Botanical Club, and of the Torrey Botanical Club, serving recently as a member of its Field Excursion Committee. When he lived in Washington he became a member of the Washington Biologists' Field Club, and of the Biological Society and Botanical Society there. He belonged to several other such societies, for his interes in science was broad. He was also an extensive reader along general scientific lines.

His herbarium of vascular plants was based mostly on the floras of Lincoln and Cumberland Counties in Maine, with some specimens from northern Rhode Island. His interest in this branch of botany

gradually gave way to an intense interest in the mosses, so that in 1921 he gave his carefully mounted specimens to the New England Botanical Club, where they form a valuable addition to the Club Herbarium.

At the Farmington meeting of the Josselyn Botanical Society of Maine in 1896, Mr. Chamberlain met Prof. J. Franklin Collins of Brown, and a year later at the Dover meeting Prof. Collins definitely interested him in the mosses. This friendship led to his graduate work at Brown, where as a part of his labors he identified a large portion of the mosses collected by Prof. Collins on Mt. Katahdin, which several members of the New England Botanical Club visited in 1900. The interest in mosses continued and grew steadily till he became an acknowledged authority on them. It had been Mr. Chamberlain's plan to give up teaching in a year or two, so as to devote himself entirely to scientific study, and he had thought seriously of doing so last fall. He had collected a remarkably fine and complete library of bryological lore, as well as a very large moss herbarium, and he was looking forward to years of study and classification.

For over ten years he has been the efficient Secretary-Treasurer of the Sullivant Moss Society, and Business Manager of their publication, The Bryologist. He corresponded with most of the members and subscribers here and abroad, and worked constantly and faithfully for its interests, often paying minor deficits from his own pocket. Such service as his can not be paid for, it comes from a desire to help others.

This spirit of helpfulness and service was the keynote of Mr. Chamberlain's character. Although he tried to keep himself in the background, it was his underlying motive in life. He was successful in helping others, too, in more ways than can be given here. Relatives, friends, students, and even casual acquaintances, all remember his characteristic ways of speech and writing, and the spirit that was in the man.

Mr. Chamberlain wrote several articles for Rhodora in its early days, and has been a frequent contributor to the pages of The Bryologist. As a letter-writer he was unexcelled, putting a great deal of himself into what he wrote, and gifted there, as elsewhere, with a strong sense of humor.

During the school year in New York he often took week-end trips in the open country with a small group of men to break the monotony

of teaching, and to reinvigorate him for indoor work. It was thus that he planned his last trip to Bear Mountain to view the total eclipse of the sun on January 24. The temperature was below zero, and he was thoroughly chilled, so that he had a bad cold when he returned. He taught the following week, but gave up on Friday night. Pneumonia developed, and he died quietly on the evening of February 2. He was the only child of his parents and never married, so he left no near relatives, except two aged aunts in the West.

By the terms of his will his library and collections are given to the New England Botanical Club where they will be of very great value to bryological students. His other property was left to Bowdoin College.

Hingham, Massachusetts.

PONTEDERIA VERSUS UNISEMA.

M. L. Fernald.

In recent years the American genus which has long passed as *Pontederia* L. has begun to appear in American botanical literature as *Unisema* Raf., and the common Pickerelweed of eastern America as *Unisema cordata* (L.) Farwell.[1] Since the proposition to relegate the name *Pontederia* to the Asiatic and Australian genus *Monochoria* Presl and to use for the American genus Rafinesque's name *Unisema* is not new and since there are valid arguments both for and against such a procedure it may be clarifying to look into the history of the Linnean genus *Pontederia*. As it appeared in the *Species Plantarum* (1753), *Pontederia*[2] had three species: (1) *P. ovata* of Malabar, which had been described and illustrated by Rhede, a plant with 1 stamen and consequently included by Linnaeus through error in his *Pontederia*, a genus which he placed in the class *Hexandria;* (2) *P. cordata*, the *Pontederia* of Linnaeus's *Hortus Cliffortianus* (1737), Gronovius's *Flora Virginica* (1739), etc., the Pickerelweed of eastern America, with dense spikes and with 1-seeded indehiscent fruits; and (3) *P. hastata* of India, the *Pontederia* of Linnaeus's *Flora Zeylanica* (1747) or the *Carim gola* of Rhede, a plant with umbels of flowers and with 3-valved many-seeded capsules.

[1] Farwell, Papers Mich. Acad. Sci. Arts and Lett. iii. 91 (1923).

[2] Sp. Pl. i. 288 (1753).

The description of the genus *Pontederia* in the 5th edition of the *Genera Plantarum* (1754) was a mixture based upon the 2nd and 3rd species of the *Species Plantarum;* but in general the name has been maintained by post-Linnean botanists for the American *Pontederia cordata;* Linnaeus's 1st species, *P. ovata,* clearly not belonging in the class *Hexandria,* being excluded as a member of the family *Marantaceae,* and the 3rd species, *P. hastata,* separated off as *Monochoria* Presl. Rafinesque[1] raised the point, that the generic description of Linnaeus called for "*Capsula* carnosa, conica, apice late inflexo, trilocularis, triangularis, trisulca. SEM. subrotunda, plurima," which could apply only to his 3rd species, *P. hastata,* and that, therefore, *Monochoria* must be called *Pontederia* and *P. cordata,* with an indehiscent 1-seeded fruit, must belong to the new genus *Unisema* Raf. In thoroughly characteristic style Rafinesque scored Nuttall and others who maintained *Pontederia* for *P. cordata:* "All the servile American botanists, and even Torrey, who has verified the fruit, have followed this absurdity." Nevertheless not only practically all the "servile" American botanists since Rafinesque but such Europeans as Kunth, Bentham & Hooker, Solms-Laubach, Schönland, and even Otto Kuntze, have maintained *Pontederia* for the 1-seeded American group and have treated the many-seeded *P. hastata* as *Monochoria.* But since Farwell (l. c.) now revives *Unisema* for *P. cordata* it is evident that the reasoning which has appealed to the principal systematic botanists since Linnaeus needs statement.

That Linnaeus did not have a clear understanding of the floral structure of the plants he assembled under *Pontederia* is apparent from his three species: *P. ovata* with 1 stamen but put by Linnaeus into a hexandrous genus; *P. cordata* with six stamens and a 1-seeded indehiscent utricle; and *P. hastata* with six stamens and a many-seeded 3-valved capsule. Linnaeus's lack of understanding of the real floral structure of these plants is further exemplified by his editing of Loefling's *Iter Hispanicum* (1758) in which he reduced Loefling's manuscript genus *Phrynium,* with 3 stamens, without comment to his own supposedly hexandrous *Pontederia.* In other words, to say that Linnaeus, in the *Species Plantarum* and later, meant one of these plants rather than another as the "type" of *Pontederia* is futile; to him *Pontederia* was a group of superficially similar but structurally quite dissimilar plants and properly to understand what he originally

[1] Raf. Journ. de Phys. lxxxix. 261 (1819) and Med. Fl. ii. 105 (1830).

meant by the name it is necessary to trace *Pontederia* to its source. This, fortunately, is simpler than many nomenclatorial problems which lead back of 1753.

The name *Pontederia* seems to have started in 1737 when, in the 1st edition of the *Genera*, Linnaeus gave the same mixed description as in the 5th, the capsules 3-valved and many-seeded, but, stated that the plant was communicated by Gronovius (from Virginia). Simultaneously Linnaeus published *Pontederia* in *Hortus Cliffortianus* (1737), a plant with "floribus spicatis" which "*Crescit in aquaticis* Marilandiae & Virginiae" and identified with plates of the Virginian plant published by Petiver, Morison and Plukenet. Then, as a wholly secondary matter, he treated as probably congeneric with the Virginian species the Indian plant with 3-valved capsules and many seeds, saying: "*Hujus generis videtur Carim-golo Hort. mal.* 11. p. 91. t. 44." And at this time, dealing primarily with the American plant, but associating with it as an apparently congeneric element the Indian species, Linnaeus gave the dedication of the name *Pontederia:*

"*Dixi hoc plantae genus a* Julio Pontedera, *in Gymnasio Patavino Botanices Professore, Compendii Tabularum botanicarum, Dissertationum de floribus compositis & doctissimae Anthologiae auctore; ubi in examinando partes fructificationis paucos pares habuit.*"[1]

The confusion of the two plants, the Virginian with indehiscent 1-seeded fruits, the Indian with dehiscent many-seeded capsules, certainly entered into the original account of *Pontederia;* but at the time of dedicating the genus to Pontedera Linnaeus had chiefly in mind the plant of Maryland and Virginia. This fact is definitely established by his citations under the primary account, both in the *Genera* (1737) and in *Hortus Cliffortianus* (1737), of Morison, Gronovius, Petiver and Plunkenet, all of whom had the American Pickerelweed. This intent of Linnaeus is further made evident in the *Genera* ed. 5 (1754). There the mixed generic description of earlier editions is repeated and the only change is the insertion of the generic synonym "Michelia *Houst. A. A.*" This refers to the subsequently published *Michelia* Houst. Rel. Houst. (1781), a tropical American plant with 1-seeded fruits and clearly congeneric with *Pontederia cordata.*

In view of this historic evidence it is certain that there is good justification for maintaining *Pontederia* as Linnaeus originally intended it, for the American Pickerelweed,[2] even though Linnaeus

[1] L. Hort. Cliff. 133 (1737).

[2] Since this paper was prepared Mr. T. A. Sprague has reached the same conclusion, by the same course of reasoning. See Journ. Bot. lxii. 327 (1924).

himself confused the situation by merging with it members of three other genera (including another family) and describing the fruit of the Indian plant. As stated in Article 45 of the International Rules: "If the genus contains a section or some other division which, judging by its name or its species, is the type or the origin of the group, the name is reserved for that part of it." If, however, it is argued that from the start the generic description of *Pontederia* belonged as much to *P. hastata* as to *P. cordata* and that the two have equal claims to the generic name, it is important to note that ever since Linnaeus the overwhelming majority of botanists have treated the former as *Monochoria* and the latter as *Pontederia.* It is, therefore, incumbent upon those who desire plant nomenclature to remain generally intelligible to maintain this usage for, as clearly stated in the International Rules (Art. 5), "where the consequences of rules are doubtful, established custom becomes law."

The Pickerelweed of the northern United States and southern Canada, ranging southward to Virginia, Missouri and Kansas, more locally to northern Florida and Oklahoma, has very dense spikes, its blue-purple flowers white-villous especially before anthesis, its mature fruits 6–10 mm. long and its obovoid reddish seed 3.5–4.5 mm. long, 2–2.5 mm. in diameter. Its leaf-blades are comparatively soft, of very variable outline, the upper or cauline leaf with a slender petiole (above the sheath) averaging 4.5 cm. long.[1] This plant is *Pontederia cordata* L.

In tropical and subtropical eastern America the plant which passes as *Pontederia cordata* has firmer or harder foliage, the cauline leaves usually on shorter petioles (averaging 2.7 cm. long).[2] Its spike is looser-flowered than in the northern plant; its flowers are rather smaller and, instead of being white-villous, are glandular-dotted and sometimes hirtellous, in age often quite glabrate. Such mature fruits as have been available are 5–6 mm. long and the seeds 2.7–3.2 mm. long, 1.8–2 mm. in diameter. This plant has been examined from Paraguay, Brazil and Cuba and in the United States from Florida to Texas and northward to Virginia. Its narrow-leaved extreme was beautifully characterized by Nuttall as *P. lanceolata*[3] from Georgia and South

[1] Measurements of 60 specimens show a range of 1.5–12 cm. with an average of 4.5 cm.

[2] Measurements of 25 specimens show a general range from 0.5–3, very rarely to 14 cm., with an average of 2.7 cm.

[3] Nutt. Gen. i. 216 (1818).

Carolina, Nuttall specially emphasizing the "petiole very short," leaf "very opaque, in *P. cordata* the leaf is diaphanous when held to the light," and "unexpanded flowers and filaments of the stamina thickly covered with round, blackish, glandular atoms." The broader-leaved form of *P. lanceolata* has been characterized as *P. cordata*, forma *brasiliensis* Solms.[1]

The Pontederias of temperate North America may be distinguished by the following key:

a. Spike dense: young and commonly the mature flowers white-villous: mature fruits 6–10 mm. long: seeds 3.5–4.5 mm. long, 2–2.5 mm. in diameter: leaves comparatively soft; the cauline with petioles averaging 4.5 cm. long *b*.
  b Leaves cordate at base.
    Leaves narrowly deltoid-ovate, tapering with straight sides from base to apex . . . . *P. cordata*
    Leaves broadly ovate, gradually curved from the broad base to the blunt summit . . . . *P. cordata*, forma *latifolia*
  b. Leaves truncate to tapering at base, narrowly deltoid to linear-lanceolate . . . . *P. cordata*, forma *angustifolia*
a. Spike rather loose: young flowers glandular and sometimes hirtellous, not villous, glandular or glabrate in age: mature fruits 5–6 mm. long: seeds 2.7–3.2 mm. long, 1.8–2 mm. in diameter: leaves comparatively hard; the cauline with petioles averaging 2.7 cm. long *c*.
  c. Leaves lance-oblong to lance-linear, narrowed at base . . . . *P. lanceolata*.
  c. Leaves deltoid to ovate, truncate to cordate at base.
    Leaves narrowly deltoid-ovate, tapering with straight sides from base to apex, truncate to shallowly cordate at base . . . . *P. lanceolata*, forma *trullifolia*.
    Leaves ovate, gradually curving from the broad deeply cordate base to the summit . . . . *P. lanceolata*, forma *brasiliensis*

P. cordata L. Sp. Pl. i. 288 (1753). *Unisema cordata* (L.) Farwell, Pap. Mich. Acad. Sci. iii. 91 (1923).—Peaty, sandy or muddy shores, Nova Scotia to southern Ontario, south to northern Florida and Oklahoma.—Doubtless some of Rafinesque's proposed species of *Unisema* belong here but his descriptions are not detailed enough for definite identification.

Forma latifolia (Farwell) House, N. Y. St. Mus. Bull. No. 254: 207 (1924). *Unisema cordata*, forma *latifolia* Farwell, l.c. 92 (1923).—Usually in richer soils, and often want ng in the more silicious areas.

Forma angustifolia (Pursh) Solms in DC. Monogr. iv. 532 (1883). *P. angustifolia* Pursh, Fl. Am. Sept. i. 224 (1814). Var. *angustifolia* (Pursh) Torr. Fl. N. and Mid. St. i. 343 (1824). *Unisema Purshiana* Raf. Med. Fl. ii. 107 (1830) and doubtless other spp.—Sandy or peaty shores, Prince Edward Island to Wisconsin, and southward east of the Appalachian system.

It is quite impossible from the meagre descriptions to say whether *P. lancifolia* Muhl. Cat. 34 (1813) and Ell. Sk. i. 382 (1817) belongs

[1] Solms in DC. Monogr. iv. 533 (1883).

here or with *P. lanceolata.* The description of the leaf applies to either, and neither Muhlenberg nor Elliott mentions the diagnostic characters. It is probable that *Unisema heterophylla* Raf. Med. Fl. ii. 108 (1830), "From New York to Louisiana" was based upon both this and the next.

P. LANCEOLATA Nutt. Gen. i. 216 (1818). *P. cordata,* var. *lanceolata* (Nutt.) Griseb. Cat. Pl. Cub. 252 (1866).—South Carolina to Texas and Paraguay. Since this species has been confused with *P. cordata,* forma *angustifolia,* it is desirable to cite characteristic specimens. GEORGIA: between Weycross and Ruskin, Ware Co., *Harper,* no. 1469. FLORIDA: Indian River, *Palmer,* no. 538; Duval Co., *Curtiss,* no. 2988,* *Fredholm,* no. 5126; South Jacksonville, April 7, 1897, *Churchill;* Eustis, Lake Co., *Nash,* no. 450. TEXAS: *Lindheimer,* no. 194. CUBA: "introduced" in river, Taco Taco, Pinar del Rio, *Wright,* no. 3260; Coloma, Pinar del Rio, *Britton & Cowell,* no. 9693. BRAZIL: Matto Grosso, *Leeson.* PARAGUAY: in regione cursus superioris fluminis Apa, *Hassler,* no. 7849.

Forma **trullifolia**, n. f., forma typica recedit foliis anguste deltoideo-ovatis basi truncatis vel subcordatis.—VIRGINIA: Point Micon Reach, *Tidestrom,* no. 82. NORTH CAROLINA: Spencer, July 12, 1919. *P. O. Schallert.* FLORIDA: Okeechobee region, Brevard Co., August 3, 1903, *Fredholm,* no. 5927 (TYPE in Gray Herb.); Eustis, Lake Co., *Nash,* no. 449. TEXAS: San Patrico, *Lindheimer,* no. 2516; Houston, *Lindheimer.*

Forma **brasiliensis** (Solms), n. comb. *Urisema acutifolia* Raf. Med. Fl. ii. 107 (1830) based upon the characteristic figure in Lam. Encyc. t. 225 (1793). *P. cordata,* forma *brasiliensis* Solms in DC. Monogr. iv. 533 (1883).—The following are characteristic. FLORIDA: without definite locality, *Chapman* (Bilt. Herb. no. 752c); Duval Co., *Fredholm,* no. 5237; Port Orange, *Straub,* no. 134; Fort Myers, *Hitchcock,* no. 354, *J. P. Standley,* no. 104. LOUISIANA: Gretna, *Ball,* no. 329. PARAGUAY: central Paraguay, *Morong,* no. 490; near Lake Ypacuray, *Hassler,* no. 12,683; Sierra de Maracayú, Hassler, no. 5363.

GRAY HERBARIUM.

POSSIBILITIES OF HYBRIDISM AS A CAUSE OF VARIATION IN POLYGONUM.

E. E. STANFORD.

DURING the last century a considerable number of hybrids within the subgenus *Persicaria* of the genus *Polygonum* have been reported in Europe. On the American side very little attention seems to have

been paid to the possibility of such crosses. From a comparison of Focke,[1] Figert,[2] Ascherson & Graebner,[3] and other sources, it appears that the first *Persicaria* hybrids to be announced as such were published as *Polygonum minori-Persicaria* and *P. dubio-Persicaria* by Alexander Braun[4] in 1824. What Ascherson & Graebner regard as the same plants have subsequently been frequently reported under various designations, and are now referred by them to *Polygonum Persicaria* × *minus* and *P. Persicaria* × *mite* (*P. dubium* having been reduced to *P. mite* Schrank). Since this early publication a considerable number of other *Persicaria* hybrids have been listed by various writers; the Ascherson & Graebner treatment, for example, enumerating the supposed results of such crossings under all the European species listed by them with the exception of *Polygonum amphibium* L. which appears, from examination of the literature, not to be considered to hybridize. This is not surprising, for *P. amphibium*, though extremely variable, is considered to have no close relatives in Europe, all the forms and varieties occurring there being generally considered to be below specific rank.

The criteria upon which reliance has been placed in the detection of hybrids have usually been demonstrable blending of the characters of the supposed parents, the presence of the latter in the vicinity, a greater or less degree of sterility, and often vigorous growth coupled with the production of unusually conspicuous flowers. The European Persicarias, with the exception of *Polygonum amphibium*, are annuals, and the hybrids, on account of their usual considerable sterility, have not usually been considered as becoming independently established or self-maintaining. The majority of these proposed hybrids, according to their bibliographies as given in the Ascherson & Graebner treatment, have mostly also been published by other authors as varieties or new species. The annual Persicarias, as shown in a previous paper[5], are usually extremely productive of normal achenes, and the character of sterility has therefore been especially accentuated by most students who have described otherwise puzzling or "off-type" specimens as hybrids.

[1] Focke, Die Pflanzen-Mischlinge, 348, 349 (1881).

[2] Figert, *Ueber Bastarde aus der Gattung Polygonum.* Allgem. Bot. Zeitschr. i. 26–30 (1895).

[3] Aschers. & Graebn. Syn. Mitteleur. Fl. iv. 800–875 (1913).

[4] A. Br. Fl. vii. 359, 360 (1824).

[5] Stanford, Rhodora, xxvii. 41–47 (1925).

Hy,[1] one of the few European authors to have published on floral dimorphism in *Persicaria,* was interested also in hybridism, and summed up his observations in part as follows:

"1. Dans les espèces annuelles de la section Persicaria les fleurs présentent un cas remarquable de dimorphisme par cleistogamie: sur la même inflorescence, les ûnes restent closes et fertiles, les autres s'ouvrent mais demeurent d'ordinaire stériles, faut de pouvoir se féconder elles-mêmes.

2. Dans les plantes normales les fleurs ouvertes et stériles sont toujours en moindre nombre même sur les espèces qui en présentent le plus comme P. Persicaria L. et P. mite Schr.

3. Dans quelques individus disseminés en petit nombre au milieu de lêurs congénères, ces mêmes fleurs ouvertes et stériles existent seules ou à peu près, d'où il result stérilité complète ou presque complète pour la plante entière . . . dans . . . P. Persicaria × P. mite la proportion des fleurs fertiles était seulement de 1/150; dans . . . P. Persicaria × P. minus, 3 graines seulement se sont rencontrées sur 10 pieds . . . P. minus × P. hydropiper, n'a présenté aucune graine fertile. Ma conclusion était celle-ci: l'hybridité seule a pu causer cette stérilité."

Hy was also familiar with the type of heterostyly displayed by *Polygonum amphibium* L., which he considered of a type "absolument distinct . . . un example de plus à ceux . . . plantes physiologiquement dioques . . . sur les ûnes les styles sont courts, les étamines longuement saillantes et les fleurs demeurent stériles; sur les autres, les fleurs n'ont de saillant que le style mais produisent de beaux et bons fruits."

Of more recent writers Schuster[2] in his revision of *Polygonum lapathifolium* L. devoted considerable attention to hybridism as concerning his conception of this species and the numerous subdivisions which he made of it. He noted the occurrence of sterile pollen both in hybrids and in what he considered pure species, and stated:

"Allein der s t e r i l e P o l l e n bietet überhaupt kein sicheres Merkmal zur Erkennung von Polygonum-Bastarden, weil auch die Ähren der reinen Arten einen mehr oder weniger schlechten Pollen besitzen und unfruchtbar sind. Von den Polygonum-Bastarden wird in der Literatur allgemein behauptet, dass sie unfruchtbar sind; ich konnte indessen nicht e i n e n Bastard finden, der vollkommen unfruchtbar gewesen wäre; allerdings ist die Fruchtbarkeit eine r e d u z i e r t e indem in der Regel die Ähren eines Bastards mehr unfrucht-

[1] Hy, Troisième Note sur l'herborisation de la Faculté des Sciences d'Angers (1882); *Sur le dimorphisme floral dans quelques especes du genre "Polygonum."* Rev. de Bot. iv. 87–89 (1885).

[2] Schuster, *Versuch einer natürlichen Systematik des Polygonum lapathifolium* L. Mitteil. Bayerisch. Bot. Gesellsch. ii. 50–59 and 74–78 (1907).

bare Blüten zu enthalten pflegen als die reinen Arten . . . Samen von P. mite × Persicaria . . . die ich aussäte, keimten rasch und leicht. Natürlich können auch vollständig sterile Hybriden bei Polygonum vorkommen, jedenfalls aber ist dies nicht die Regel. . . ."

Schuster also noted that poorly nourished plants of *Polygonum Persicaria*, for instance, produced few fruits and by some botanists had therefore been taken for hybrids. He found pollen characters to be rather variable, and that hybrids often attracted attention by their unusual vigor. As to the pollen, further:

"Die sterilen Pollen, von denen ganz wie bei den reinen Arten bald ein grösserer bald ein geringerer Prozentsatz vorhanden ist, sind im allgemeinen nur halb so gross als die fertilen; bei P. mite × Persicaria mes en leitztere im Mittel 0,042 mm, die sterilen 0,021 mm."

He found variations in the pollen relief-markings of some hybrids which he believed to result from a blending of parental characters. He came to the conclusion that:

"P. lapathifolium nicht nur stark variiert, sondern auch sehr leicht bastardiert;" and enumerated 7 "Wirkliche Bastarde" and 3 "Vermeintliche Bastarde."

"Es ist im höchsten Grade wehrscheinlich, dass die sog. nichthybriden Übergangsformen der systematisch einander nahestehenden Polygonum-Arten nur Formen polymorpher Hybriden sind, die auch als hybridogene Arten auftreten können; wenigstens ist dies bei P. mite var ambiguum Thellung und P. foliosum Lindb. fil. der Fall."

These he had previously noted as forms of "dem polymorphen Bastard P. Hydropiper × mite." One emerges from the discussion with the feeling that what is really needed is the experimental production of a few hybrids in this subgenus, under controlled conditions, and a subsequent study of their behavior and characters. Owing perhaps to the small economic importance of these plants, and perhaps also to the inconveniently small size of the flowers, nothing of this sort appears to have been attempted.

Apparently the only American hybrid *Persicaria* thus far described as such in the American literature—at least in recent time—is *Polygonum hydropiperoides × robustius* Fernald.[1] Because of the bearing of this plant on the following discussion the original publication is quoted in full:

"P. hydropiperoides × robustius, n. hybr., caule decumbente basi valde lignescenti stoloniferoque plerumque 3–5 mm. crasso;

[1] Fernald, Rhodora, xxiv. 173, 174 (1922).

ramis floriferis adscendentibus 0.3–1 m. longis; foliis anguste ellipticis vel elliptico-lanceolatis acuminatis vel acutis 0.5–2 dm. longis 0.8–4 cm. latis; ocreis laxe cylindricis strigosis ciliatis, ciliis 2–5 mm. longis; pedunculis erectis elongatis; spicis filiformibus plerumque 0.4–1 dm. longis alternifloris, rhachi purpurascenti; ocreolis ciliatis: perianthiis lacteis 2–3 mm. longis, epunctatis vel rare punctatis: achaeniis vacuis.

Nova Scotia: in great abundance in peat and granite gravel bordering outlet of Lamb's Lake, Annapalis Co., July 19, 1921 (foliage), *Fernald, Bartram, Long & Fassett*, no. 23,802, August 29, *Fernald & Long*, no. 23,803 (type in Gray Herb.) and in *Pl. Exsicc. Gray.* September 16, *Donald McPherson*, no. 23,804.

Exactly combining the aspect and characters of the two species, both of which occur with or near it. In its coarse habit with stout subligneous base nearer *P. robustius;* in foliage intermediate; in the spike showing the slender habit of *P. hydropiperoides* and the purple color of the rhachis, but in the large milk-white flowers and the great length of the spikes suggesting *P. robustius*. Practically all the achenes are empty. Out of 135 sheets of specimens collected on August 29 we were able to secure only 5 partially filled achenes; while a mass of 100 or more older inflorescences collected in September by Mr. McPherson yielded no good achenes."

Both the parents of this plant are perennials, and, while seeding freely, also perennate by rhizomatiform stems. The hybrid colony, according to a personal statement to the writer by Professor Fernald, covered a space of many square rods, was spreading rapidly by stem-rooting, and might conceivably have arisen from a single seed.

Preliminary examination of the considerable amount of material ascribed by its various collectors to *Polygonum hydropiperoides* Michx., *P. amphibium* L., [*P. natans* (Michx.) Eaton] and *P. Muhlenbergii* Wats. [*P. coccineum* Muhl.] and accumulated in the Gray Herbarium indicated that here were three essentially well defined species whose representatives, while agreeing sufficiently with the normal type to be generally referred there, yet differed habitally and technically in a highly erratic manner. The material of *P. hydropiperoides*, a species more closely related to the bulk of the subgenus than the other two, often suggested a blending with other species. That of the amphibious species, which were apparently closely related, but not particularly akin to any other well recognized species in North America, often approached each other quite closely, particularly in aquatic phases. The opportunity of comparing conditions existing in this material with the better defined species of the group and that of the characteristic and well-defined hybrid above cited suggested that the latter might serve as well as an artificially produced hybrid for the establish-

ment of some idea as to whether the variations in these puzzling species might be due to the variability common in semi-aquatics, whether they represented more stable developments worthy to rank as varieties or possibly species, or whether the possibility of hybridism might also enter in.

The consideration of hybridism, naturally, was correlated with the study of flower-forms referred to more particularly in another paper,[1] in order to determine by what means such crossing might be brought about, as well as to consider the possibility of permanency of variations thus established. While the more showy species of *Persicaria* have well developed nectaries, and, to quote from a private communication from E. F. Phillips, Apiculturist, United States Department of Agriculture, "yield considerable quantities of nectar and are important honey plants,"[2] it is the writer's belief that close-fertilization is the rule and cross-fertilization the exception in the Persicarias of the northern and western states, with the exception of the amphibious group and possibly others of heterostyl habit in which the reverse is true. Granted a fertile close-fertilized hybrid, however, the chances of its survival would appear to be considerably greater than of one of a group in which cross-fertilization is the rule. Perennial Persicarias, of which *Polygonum natans*, *P. coccineum*, and *P. hydropiperoides* are evident examples, also occur in some number in America, in contrast to the condition in Europe, where *P. amphibium* is the only perennial. Their hybrids, like that cited above, would naturally tend to persist longer than those restricted to seed reproduction by annual habit.

In view of the recent interest in pollen conditions as a criterion of hybridism[3] the examination of the pollen of these plants at once

[1] Stanford, Rhodora, xxvii. 41–47 (1925).

[2] According to Pellett (Am. Honey Pl.), *P. Persicaria*, "heart's-ease," is the most generally important in this respect, though it varies greatly in value in different sections of the country. "This plant, so valuable in Illinois and Nebraska, is of no importance in Maine; a bee is rarely seen on the flowers." "The honey . . . varies greatly, both in quantity and quality. Some species do not seem to yield at all, at least not regularly, while others produce large quantities of nectar." This writer also counts the amphibious Persicarias as valuable honey-plants. Knuth (Handb. Fl. Poll.) from European studies, does not assign *P. Persicaria* or any other member of the genus especially high rank as a bee-plant. Jepson (Fl. Calif.) cites *P. acre* (*P. punctatum* Ell.) as an important honey-plant in California, although it seems not to be highly ranked elsewhere. Regional influence on honey-production seems much in need of study.

[3] The scope of the present paper does not permit a review of the extensive literature on pollen sterility, or a summary of the divergent opinion as to the value of defective pollen as a criterion of hybridism. Among the more recent American contributions

suggested itself. For this purpose the pollen of the staminate type of flower was used, as being much more abundant. For examination flowers on the verge of opening, but as yet unfolded, were chosen. After opening, both the pollen and the anthers soon disappear, and the flowers are often spoiled for the present purpose by the introduction of foreign pollen. The anthers were mounted in water, the pollen teased out and examined with various powers of the compound microscope. Water is not a proper mounting material for all types of pollen, but gives good results with that of *Persicaria* as obtained from dried herbarium material. Inasmuch as no germination tests could be carried out, no attempt was made to estimate exact percentages of imperfect pollen, although in most cases this could probably be done with a fair degree of accuracy. Variation between different specimens clearly referable to the same species is sufficient to render estimates based on examination of less than some scores of specimens more or less of an approximation.

The pollen of the subgenus *Persicaria* is spherical or nearly so, dark-pigmented, yellowish-brown under the microscope, and marked hexagonally more or less in relief. The diameter, in apparently average material, varies from 0.033–0.040 mm. in *Polygonum lapathifolium* to 0.060–0.066 mm. in *P. coccineum* (0.092 mm. in the more abnormal of the latter species). That of *P. hydropiperoides* averages 0.043–0.050 mm. in material showing virtually all apparently good pollen; this species is one of the more variable in the size, shape, and apparent quality of the anther-contents. The pollen of *P. robustius* is of approximately the same size; in this species it appears much more constantly normal, although the number of available specimens was not large.

In general it may be said that the report of Schuster that frequent variations exist in apparently good species was confirmed. The amount of variation differs widely in different species, and in different material, apparently typical, of the same species. In *Polygonum pensylvanicum*, for instance, as well as in *P. robustius*, the grains are usually very constant in size and only occasional plants show a variable proportion (10% or more) of defective individuals. That of

to the subject mention might be made of the study of blackberries by Brainerd and Pieterson, in which, as pointed out by Fernald (Rhodora, xxii. 185–191) a number of well recognized species are described as having from 70% to 85% of imperfect pollen, while others are listed as hybrids of such species, yet having as low as 10% imperfect pollen.

the essentially monotypic *P. virginianum* L. (subgenus *Tovara*) is extremely constant.

The flowers of *Polygonum hydropiperoides* × *robustius* are of the open type, while the panicles of its parents usually contain both types. The pollen of the hybrid is produced in considerable quantity, though less abundantly than in the open flowers of the parent species, and is very variable in size and appearance. The grains range from 0.016–0.066 mm., the smaller evidently empty or distorted and nearly or quite unpigmented. Judging from the microscopic appearance in comparison with apparently normal pollen of other species, not over 5–10%, probably much less, could function. Correlated with this is a complete lack of development of the ovary, from which coordinate conditions in the egg may be deduced. A very similar type of defective pollen occurs frequently in specimens referred to *P. hydropiperoides*. Occasionally it is accompanied by wide-open evidently infertile flowers, in plants whose considerable variance from the type is often suggestive of mixed parentage with a more or less definite indication of the other species involved. More commonly it accompanies an apparently normal achene-production. Sometimes plants with apparently normal achenes and a large proportion of defective pollen appear inseparable from the type; more frequently, however, points of variance may be found. In this species the problem is complicated by the appearance of occasional plants apparently wholly of the pistillate type, with little or no pollen, and occasionally (more rarely) plants of the staminate type. It may be said that the appearance of considerable percentages of defective pollen in *P. hydropiperoides* is usually, but not invariably, connected with an "off-type." In the closely related *P. opelousanum* Riddell a variation was found which appears to be a blend of that plant with *P. punctatum* Ell. Specimens in most cases showed defective pollen, but the plant produced achenes in profusion.

Foreign hybrid material in the Gray Herbarium is exemplified by specimens referred to *Polygonum lapathifolium* × *Persicaria*, *P. Hydropiper* × *minus*, *P. Hydropiper* × *mite*, *P. minus* × *Persicaria*, and *P. mite* × *Persicaria*. In general these specimens reveal a median character between their supposed parents and show pollen- and achene-characters comparable with some of the "off-types" discussed above.

In *Polygonum natans* and *P. coccineum* the segregation of flower-types somewhat complicates matters. In the long-styled flowers

pollen is usually absent. The ranges of the two species largely coincide except for a central area running southward and southwestward from Illinois, where *P. coccineum* runs southward into Mexico, apparently unaccompanied by *P. natans.* Where the ranges coincide the pollen of the short-styled flowers usually shows a large percentage of defective grains of a type quite comparable with that of the Nova Scotian hybrid above referred to. The long-styled panicles usually show a high degree of infertility and are often entirely barren. In the central belt mentioned, the pollen of the short-styled flowers of *P. coccineum* is usually normal, and the fertility of the other type appears to run higher, though still below what would be considered normal in another species.

Examination of all the short-styled specimens of *P. amphibium* L. in the Gray Herbarium (12 sheets) showed only one where the pollen was noticeably abnormal. In this European species, as in *P. coccineum* in the central North American belt referred to, the fertility of long-styled panicles is below what would be expected in another species, especially in the terrestrial form. Rather surprisingly, in the American *P. natans,* forma *Hartwrightii*[1] the pollen seems to be more nearly normal than in the aquatic form, although the latter is more frequently productive of achenes.

It appears probable that the cause of sterility in these perennials is in part bound up with the development of a vegetative mode of perennation and spreading, and not unlikely that in the American species the condition is further complicated by a considerable amount of cross-breeding; the result of these two factors, together with the variability common to aquatics, being visible in the highly variable series of plants so liberally christened by Greene.[2]

As a general conclusion it may be stated, that the evidence does not warrant changing the systematic rank of species or varieties which are known to be self-perpetuating and which have become more or less widespread over a definite range, but it does, in the present state of our knowledge, indicate the advisability of caution in the proposal of new species or varieties on the basis of variations seen in occasional herbarium sheets which show a considerable proportion of defective pollen and about the range and fertility of which little or nothing is known.

Western Reserve University.

[1] Polygonum natans, forma **Hartwrightii** (Gray), comb. nov. *P. Hartwrightii* Gray, Proc. Am. Acad. viii. 294 (1870). To be discussed in succeeding paper.

[2] Greene, *Certain Polygonaceous Genera.* Leafl. i. 17–50 (1904).

ANOTHER ARNICA FROM NEWFOUNDLAND.

M. L. Fernald.

When I published a study of the *Eastern American Representatives of Arnica alpina*[1] in 1924, in which seven species of this group were recognized from the Torngat Mts. of Labrador, the Long Range of Newfoundland and the mountains and cliffs of the Gaspé Peninsula, I was unaware that an eighth species had been collected by Messrs. Kenneth Mackenzie and Ludlow Griscom on Cape St. George, a western outlier of the Long Range. Mr. Griscom has most kindly placed in my hands for study a beautiful series of specimens, along with a perplexingly interesting collection of *Oxytropis, Potentilla* and other groups of arctic and cordilleran relationship, including the first *Carex concinna* R. Br. from Newfoundland and the first *Hedysarum Mackenzii* Richardson in eastern America.

The new Arnica grew on limestone barrens at Green Gardens, Cape St. George, where it was associated with *A. chionopappa* Fernald, *Kobresia simpliciuscula* (Wahlenb.) Mackenz., *Carex glacialis* Mackenz., *C. misandroides* Fernald, *Lesquerella arctica* (Wormsk.) Watson, *Dryas integrifolia* Vahl, var. *canescens* Simmons, *Antennaria eucosma* Fernald, and other specialties of the neighboring Table Mt., Port à Port; and the collectors very naturally supposed they had merely found a new station for *Arnica pulchella* Fernald of Table Mt.

The plant of Green Gardens is, however, quite distinct from *A. pulchella*, being equally close to *A. alpina* Olin & Ladau of the Arctic, *A. Sornborgeri* Fernald of the Torngat Mts. and *A. attenuata* Greene of Alaska and Yukon. From each of these it is distinguished by several characters and it may appropriately be called

Arnica **terrae-novae**, n. sp., rhizomate gracili horizontali; caule simplici vel furcato 1.7–3.4 dm. alto sparse piloso supra lanato; foliis rosulatis lineari-lanceolatis vel anguste oblanceolatis 0.5–1.4 dm. longis 0.5–1 cm. latis, 3–5-costatis integris sparse pilosis plus minusve glandulosis; foliis caulinis 4–5-jugis, inferioribus anguste oblanceolatis petiolatis integris sparse pilosis papilloso-glandulosisque, superioribus valde reductis apice callosis; pedunculis solitariis 5–13 cm. longis nudis vel bracteolatis, bracteolis linearibus apice subulatis; capitulis 4.5–7 cm. diametro; involucro 1.3–1.5 cm. alto basi lanato; bracteis 13–20 rhomboideo-lanceolatis, exterioribus 2.7–4 mm. latis acuminatis laxe villosis; ligulis 9–13 luteis, lamina 1.6–2.5 cm. longa 5–8 mm. lata 9-nervata apice 3-dentata, dentibus acutis longioribus

[1] Fernald, Rhodora, xxvi. 103–107, t. 143 (1924).

3–8 mm. longis; corollis disci 8–9 mm. longis, tubo villoso 4–5 mm. longo; achaeniis 5.5–6 mm. longis hirsutis; pappo maturo 7.5–8.5 mm. longo albo, setis barbellulatis.

Rhizome slender, horizontal: stem simple or forking from the base, 1.7–3.4 dm. high, sparingly pilose, lanate at summit: rosette-leaves linear-lanceolate or narrowly oblanceolate, 0.5–1.4 dm. long, 0.5–1 cm. broad, 3–5-ribbed, entire, sparingly pilose and more or less glandular: cauline leaves 4–5 pairs; the lower narrowly oblanceolate, petiolate, entire, sparingly pilose, papillose-glandular; the upper much reduced, callous at tip: peduncles solitary, 5–13 cm. long, naked or bracteolate; the bracteoles (when present) linear, subulate-tipped: heads 4.5–7 cm. broad: involucre 1.3–1.5 cm. high, lanate at base: bracts 13–20, rhombic-lanceolate; the outer 2.7–4 mm. wide, acuminate, loosely villous: ligules 9–13, yellow; the blade 1.6–2.5 cm. long, 5–8 mm. wide, 9-nerved, 3-toothed at apex; the teeth acute, the longer 3–8 mm. long: disk-corollas 8–9 mm. long; the villous tube 4–5 mm. long: achenes 5.5–6 mm. long, hirsute: mature pappus 7.5–8.5 mm. long, white; its bristles barbellulate.—Newfoundland: limestone barrens, Green Gardens, Cape St. George, July 24, 1922, *Mackenzie & Griscom*, no. 11,039 (type in Gray Herb.).

From *A. alpina*, *A. terrae-novae* is at once distinguished by its more abundant and pilose leaves, broader involucral bracts, longer and sharper teeth of the ligules, longer disk-corollas and longer achenes; *A. alpina* having only 1–3 pairs of nearly glabrous cauline leaves (in *A. terrae-novae* the 4–5 pairs pilose), the outer involucral bracts 2–3 (in *A. terrae-novae* 2.7–4) mm. wide, the blunt teeth of the ligule only 1–2 mm. long (in *A. terrae-novae* the teeth acute, the longer 3–8 mm. long), the disk-corollas 6–7 (in *A. terrae-novae* 8–9) mm. long and the achenes 3–5 (in *A. terrae-novae* 5.5–6) mm. long.

A. pulchella differs from *A. terrae-novae* in being densely villous (both stems and leaves), with callous-toothed basal leaves and only 1 or 2 pairs of cauline leaves and in having smaller heads with few (only 8–10) densely villous bracts.

A. Sornborgeri is distinguished from *A. terrae-novae* by its more glandular-viscid short indument, callous-toothed leaves (the cauline only 2 or 3 pairs), the uppermost leaves attenuate to a delicate usually curved appendage, the involucre of only 10–12 linear- or lance-attenuate bracts 1.2–1.5 mm. wide and the achenes only 3.7–4.7 mm. long.

The northwestern *A. attenuata* commonly branches above, with several (up to 12 at least) heads; has the foliage closely pilose-tomen-

tose, the involucral bracts linear- to lance-attenuate and the teeth of the ligules only 0.5–2 mm. long.

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. June, 1925. No. 318.

THE MARITIME PLANTAINS OF NORTH AMERICA.

M. L. Fernald.

(Plate 150.)

For several years it has been apparent to some students of the flora of eastern America that the plants which pass with some botanists as *Plantago maritima* L., with others as *P. decipiens* Barnéoud, are really two distinct species and that they certainly are not identical with *P. maritima* of Europe. The latter species, which does not occur in eastern America, is a characteristic plant with the scapes commonly much longer than the leaves; the bracts of the spike narrowly ovate (sometimes described even as lanceolate), much longer than broad; the calyx-segments narrowly ovate to narrowly oblong and with conspicuously ciliate-denticulate keels; and the mature capsules slender and acute. Whether true *P. maritima* occurs in America is not wholly clear. In the Gray Herbarium there is a specimen typical in every detail marked Sitka (coll. *Bongard*) but all other Alaskan material seen is the Pacific American *P. juncoides* Lam. The common American plants which have passed, off and on, for *P. maritima* have less contrast in the length of leaf and scape; the bracts broadly ovate to subreniform, as broad as long; the calyx-segments broadly oblong to suborbicular, and not definitely ciliate on the keel; the mature capsules ovoid to broadly conic-ovoid and rounded at summit. In the plants of Atlantic America the anthers are well under 2 mm. in length, but on the Pacific coast they may reach a maximum of 2 mm. In such European material as is at hand (too little for generalization) the anthers are 2–2.3 mm. long.

As stated, in eastern America two well defined species of Seaside Plantain occur. One (fig. 6), a plant of salt-marsh and saline shores,

has succulent linear to linear-lanceolate leaves, usually equaling or, in the northern extreme, much exceeding the scapes; and it is commonly gathered in eastern Maine and the Maritime Provinces as a delicious vegetable under the name "Goose Tongue." Its spikes are usually blackish in general color, in all but dwarfed individuals 0.6–2 dm. long (in small plants down to less than 1 cm. long), rather loosely flowered especially at base; the bracts (fig. 6[a]) subtending the flowers are often, but not always, prolonged at tip and then exceed the calyces, being very fleshy and glabrous, with thick or gibbous keels; the calyx (fig. 6[a]) is glabrous; and the linear-oblong mostly black seeds (fig. 6[b]) are 2–3 mm. long. There is no question, judging by its scape commonly shorter than the leaves, interrupted spike, acute glabrous bracts and its range that, when he described *Plantago pauciflora*, Pursh[1] had small specimens of the "Goose Tongue" of salt marshes from Labrador to New Jersey. Pursh's description was to the point:

> P. foliis lineari-lanceolatis integerrimis glabriusculis, scapo tereti foliis breviore, spica pauciflora interrupta, bracteis ovatis acutis glabris. *pauciflora*
> On the sea-coast of New England and New Jersey. . . . Aug. *v. v.* In the Herbarium of A. B. Lambert, Esq. are specimens from Labrador, agreeing in every respect with this species.

Pursh's specific name was highly inappropriate, because only exceptionally dwarfed plants (fig. 7), occurring chiefly north of New England, have spikes notably few-flowered, and ordinarily on the coast of New England and New Jersey his *P. pauciflora* has spikes (fig. 6) longer than in any other of the maritime Plantains of America or Eurasia; but since there were already two other species bearing the name *P. pauciflora*, one of Gilibert (1782), the other of Lamarck (1783), the first perhaps not identifiable, the second identical with *P. barbata* Forst. (1789), Roemer & Schultes renamed Pursh's species, literally quoting his description and perpetuating the misleading connotation of his name by changing it merely to *P. oliganthos*.[2] During the same year Rafinesque made a gesture at publishing an appropriate name, saying in a review of Bigelow's *Florula Bostoniensis*: "*Plantago maritima*, Big. is perhaps *Pl. gibbosa*, Raf. n. sp."[3] Bigelow,[4] however, had given absolutely no diagnostic character to dis-

[1] Pursh. Fl. Am. Sept. i. 99 (1814).
[2] R. & S. Syst. iii. 122 (1818).
[3] Raf. Am. Mo. Mag. ii. 344 (1818).
[4] Bigel. Fl. Bost. 34 (1814).

tinguish his plant from others of the group and, supposing it to be *P. maritima* of Europe, had literally translated into English the Latin description in Smith's *Flora Britannica,* clearly acknowledging his source. *P. gibbosa,* a name which would be appropriate for the salt-marsh plant of eastern America but published only half-heartedly by Rafinesque and without a description, cannot be taken up and the salt-marsh plant with long and rather loose spikes and glabrous bracts and calyx must be called *P. oliganthos* R. & S.

The other species of eastern America (fig. 3) grows on headlands, cliffs and dry beaches and even ascends to alpine rocks, commonly near the coast but apparently never in salt-marsh. Its range is essentially the same as that of *P. oliganthos* but northward, where headlands preponderate over salt-marshes, it is common; southward where headlands become infrequent, it is local. This headland plant is distinguished from *P. oliganthos* by its usually narrower and decidedly less fleshy leaves commonly shorter than the scape, its dense and comparatively short spikes (the longer ones 2–10 cm. long) usually brown or drab in color; its bracts and calyx-segments minutely ciliolate (fig. 3^a), the former less fleshy and not so definitely keeled nor so prolonged as in *P. oliganthos;* the oblong to narrowly oval often brown seeds (fig. 3^b) shorter (1.2–2.3 mm. long) and the anthers averaging slightly shorter. This plant was described with remarkable precision by Barnéoud:[1]

Plantago decipiens. (Barnéoud.)

Diagn.—Pubescens. Foliis *linearibus,* acutis; spica *brevis;* bracteae *ciliolatae;* corollae *minutae,* acutae. *Stamina vix exserta.*

Descript.—5–6 poll. Collo radicis crassiusculo. Folia puberula, 3-nervia, integerrima, plana, basi lanata, scapo breviora. Scapus pubescens, teres. Spica 1-poll. bracteae acutae laetae, calycem aequantes. Calycis segmenta obtusa, ciliolata. Corollae tubus brevis, laciniae parvae. Stamina stigmate breviora. Capsula depressa 2-loc. 4-sperma.—(V. S. mss. Cl. Hooker in herb. Cl. Decais.)

Hab.—In provincia *Labrador.*—(Morrison.)

Obs. Cette espèce ressemble, au premier aspect, au *Pl. maritima,* dont elle a le port.—Cela justifie le nom de *decipiens.*

In the northern half of its range *P. decipiens* becomes very dwarfed, with scapes only 1–7 cm. long and spikes 0.5–2 cm. long. This is the plant (fig. 4) of Greenland, Iceland and arctic Europe described and beautifully illustrated by Lange as *P. borealis,* Lange[2] pointing out that it is related to both *P. alpina* L. and *P. maritima* L. of

[1] Barnéoud, Mon. Plantaginées, 16 (1845).

[2] Lange, Fl. Dan. xvi. fasc. xlvi. 5, t. mmdccvii (1867).

Europe; the former differing in its denticulate, scarcely fleshy, acute and broader leaves, its villous calyx, more ovate and obtuse corolla-lobes, and wingless seeds; the latter in its more slender and relatively shorter leaves, 2-seeded (instead of 4-seeded) capsules, linear (instead of oval) seeds, etc. As Lange further points out, the same plant (from Greenland and Iceland) had earlier been published as *P. maritima*, var. *glauca* Hornem.[1] and by Decaisne and others had been confused with *P. alpina*.

P. decipiens and its dwarf northern extreme, *P. borealis* Lange, have slender semi-terete linear erect leaves usually shorter than the scapes; but on cliffs, headlands and dry sands of Newfoundland, the Magdalen Islands, Prince Edward Island and Nova Scotia, there is a plant (fig. 5) with lanceolate or broadly linear comparatively thin spreading or rosulate often dentate leaves which usually equal or exceed the arching scapes. In aspect the plant strongly simulates the broader-leaved forms of the European *P. alpina*, though with relatively long leaves; but in the technical characters of bracts, calyx, anther and seed it departs from that species and belongs with *P. decipiens* and *P. borealis* into which it certainly intergrades.

On the Pacific coast of North America occur, besides the doubtful *P. maritima* (already discussed) two well marked plants. One (fig. 1), following the coast from southern Alaska to Alameda Co., California, has the but slightly fleshy linear or linear-lanceolate erect leaves attenuate at tip and approaching to equaling the length of the erect scapes; the other (fig. 2), confined to the coast from Sonoma Co., to Monterey Co., California, has the linear-oblanceolate to subspatulate spreading or rosulate leaves very fleshy and mostly shorter than the depressed or arching scapes. The only other difference apparent, after prolonged study, is that the more generally distributed plant with erect, long and attenuate leaves has the seeds very slightly longer than in the other. In all their technical characters of short and dense spike and in bract, calyx and seed the two plants of the Pacific coast are apparently inseparable from *P. decipiens* and *P. borealis* of the Atlantic coast; the only character of significance being a slight difference in the anther: the anthers of the plants of the Atlantic coast are 1–1.5 mm. long with subulate tips 0.1–0.4 mm. long; those of the Pacific coast slightly longer (1.5–2 mm. long, the subulate tips 0.3–0.7 mm.). The plants of both the Atlantic and the Pacific

[1] Hornem. Oec. Pl. ed. 3, i. 167 (1821).

coasts with dense spikes, ciliolate calyx-segments and comparatively small seeds (1.2–2.3 mm. long) seem, then, to be variations of one widely distributed species and it at once becomes significant that in no character which I can discover do the specimens at hand of the Patagonian *P. juncoides* Lam.[1] differ from the plant which grows from California to Alaska. They have similar elongate and attenuate leaves, and the large anthers and the comparatively large seed of that plant; and since the name *P. juncoides* is older by many years than *P. decipiens* it is evident that this wide-ranging but variable species of arctic Europe, Greenland, Atlantic North America, Pacific North America and Patagonia must take the name *P. juncoides* Lam. Although the range of this species is unusual it is by no means without parallels: such cases as *Triglochin maritima* L. and *T. palustris* L., *Catabrosa aquatica* (L.) Beauv., *Carex capitata* L., *C. incurva* Lightf., *C. microglochin* Wahlenb. *C. Macloviana* D'Urv. and *Montia lamprosperma* Cham.

For many years Asa Gray recognized that there were two representatives of *Plantago maritima* in America but he failed to detect their most important characters and his treatments are, therefore, not easy to interpret; and throughout the time from his first attempt at differentiation in 1856 to his treatment in the *Synoptical Flora* he considered first one then the other of our species to be typical *P. maritima* of Europe. In the 2d edition of the *Manual* he recognized as *P. maritima* the plant of "Salt marshes on the coast from New Jersey northward," with "very fleshy leaves," and "sepals, which have a thick keel," *i. e. P. oliganthos;* and as *P. maritima*, var. *juncoides* a plant said to be "more slender, the flowers often sparser, and the keels crestless," and occurring "only northward." The distinctions do not exactly coincide with the characters best separating our two species, and in the 5th edition Gray slightly altered the treatment, depending chiefly upon the wholly unsatisfactory characters of duration: *P. maritima*, var. *juncoides* (*P. juncoides* Lam.) being considered an annual or biennial of salt-marshes southward, while "the perennial P. maritima occurs in New Brunswick, &c., perhaps in Maine;" but, in the *Synoptical Flora*, Gray abandoned the name *juncoides*, reducing it outright to *P. maritima* of Europe, which he now treated as a perennial with spike dense and bracts rounded and short, and known to him on the Atlantic coast only

[1] Lam. Tabl. Encyl. Meth. Bot. i. 342 (1783).

north of the Gulf of St. Lawrence but on the Pacific coast from California to Bering Straits and in Patagonia; *i. e.* Gray's *P. maritima* of his latest treatment was true *P. juncoides* Lam., including the plants which I have identified with *P. decipiens* Barnéoud and *P. borealis* Lange. But still failing to detect the fundamental characters which Pursh had clearly pointed out in describing his *P. pauciflora* (*P. oliganthos*) and which Barnéoud has emphasized for *P. decipiens* and still laying undue emphasis upon the duration of the plants, Gray put all *annual* specimens under *P. decipiens* and for it drew up a good description of the salt marsh *P. oliganthos*, with "spike slender, . . . lower bracts commonly ovate-subulate and equaling or exceeding the calyx." Watson & Coulter adopted, in the 6th edition of the *Manual*, Gray's last treatment with only slight change, but Watson had been collecting on the New England coast and under the "*annual*" plant said: "The characters distinguishing biennial specimens of this form from the next are obscure"; and, knowing from field experience that these plants often begin fruiting the first year, but that they apparently continue growing through several seasons, the editors of the 7th edition of the *Manual* treated them as one variable species, *P. decipiens*. Britton, on the other hand, has consistently treated all the American material as identical with the European *P. maritima*.

That the three species, *P. maritima* L., *P. juncoides* Lam. (including *P. decipiens* Barnéoud and *P. borealis* Lange) and *P. oliganthos* R. & S. are quite distinct has been sufficiently pointed out in this discussion. The characters, bibliography and ranges of the three are summarized below. The material in the Gray Herbarium and the herbarium of the New England Botanical Club has been adequately supplemented by specimens from the Academy of Natural Sciences of Philadelphia, for the use of which I am indebted to Mr. Bayard Long, and material from the University of California most kindly loaned by Professor Setchell. The illustrations have been drawn by Miss Amelia Brackett.

a. Bracts subtending the middle and upper flowers of the spike narrowly ovate to lanceolate, distinctly longer than broad; calyx-segments narrowly ovate to narrowly oblong, ciliate and with thin ciliate-denticulate keel: mature capsules slenderly oblong-conic, acute, 1.2–2 mm. in diameter: anthers 2–2.3 mm. long: scapes much exceeding the leaves . . . . *P. maritima.*

a. Bracts subtending the middle and upper flowers broadly ovate, subreniform or suborbicular, as broad as or broader

than long: calyx-segments broadly oblong to suborbicular, not definitely ciliate on the thick or obscure keel: mature capsules ovoid to broadly conic, blunt or rounded at summit, 1.2–2.6 mm. in diameter: anthers 1–2 mm. long: scapes shorter than to slightly exceeding the leaves *b*.

b. Bracts or calyx-segments or both minutely ciliolate; the bracts rarely prolonged and with only slight keel: mature seeds oblong to narrowly oval, 1.2–2.3 mm. long: spikes usually dense to the base, the longest rarely 0.6–1 dm. long: scapes often somewhat exceeding the fleshy to thinnish leaves .... *P. juncoides.*

b. Bracts and calyx-segments glabrous or very rarely with remote ciliation; the former often with prolonged tips and with thick or gibbous keel: mature seeds linear-oblong, 2–3 mm. long: spikes often remotely flowered at base, in large plants becoming 0.6–2 dm long; leaves often equaling or exceeding the scapes, very fleshy... *P. oliganthos.*

P. MARITIMA L. Sp. Pl. 114 (1753); for synonymy see Rouy, Fl. de France, x. 123 (1908).—Europe. The only evidence of its occurrence in America is material said to be from ALASKA: Sitka, *Bongard*. Needs validation.

P. JUNCOIDES Lam. Tabl. Encyl. Meth. Bot. i. 342 (1783). A wide-ranging species divisible into five geographic varieties:

a. Anthers 1.5–2 mm. long; their subulate tips 0.3–0.7 mm. long: Pacific American and Patagonian *b*.

b. Leaves linear to linear-lanceolate, attenuate at tip, only slightly fleshy and with the scapes strongly ascending: seeds 1.6–2.3 (av. 2) mm. long .... Var. *typica.*

b. Leaves linear-oblanceolate to subspatulate, obtuse, very fleshy, depressed or spreading: scapes depressed or arching: seeds 1.3–1.7 (av. 1.5) mm. long........Var. *californica.*

a. Anthers 1–1.5 mm. long; their subulate tips 0.1–0.4 mm. long: Atlantic American and arctic European *c*.

c. Leaves linear, erect or strongly ascending, only rarely spreading, entire, commonly shorter than the scapes.

Scapes 0.5–2.3 dm. high: longer spikes 2–10 cm. long..Var. *decipiens.*

Scapes 1–7 cm. high; spikes 0.5–2 cm. long.............Var. *glauca.*

c. Leaves lanceolate to oblanceolate, depressed or wide-spreading, often toothed, commonly equaling or exceeding the scapes.............................Var. *laurentiana.*

Var. **typica,** Fig. 1. *P. juncoides* Lam. l. c. (1783). *P. maritima*, var. *juncoides* (Lam.) Gray, Man. ed. 2: 268 (1856), as to name-bringing synonym, not as to plant. *P. maritima* in part of many Am. Auth., not L.—Southern Alaska to Alameda Co., California; Patagonia. The following are referred here. ALASKA: Coal Harbor, Unga Island, July 15, 1872, *M. W. Harrington;* sea-shore, Popoff Island, Shumagin Islands, June 28, 1872, *Harrington;* upper portion of sandy tidal flat, mainland, Port Houghton, *Walker*, no. 863; beach, Skagway, *Eastwood*, no. 729; Sitka, 1867, *Tiling*. BRITISH COLUMBIA: Brown's Island, San Juan Islands, *Zeller*, no. 759; Vancouver Island, 1858, *Lyall;* on slate, District of Renfrew, Vancouver Island, *Rosendahl & Brand*, no. 21. WASHINGTON: Orchard Point, Kitsop

Co., July, 1895, *Piper*. Oregon: damp cliffs, Yaguina Head, *J. C. Nelson*, no. 2342. California: sandy ground on bay shore, Bucksport, Humboldt Bay, *Tracy*, no. 3254; on tide ground, Corte Madera, *Bigelow;* on rocks, Martinez, *Brewer*, no. 997; near Martinez, *Burtt Davy*, no. 6670; Alameda Co., 1887, *A. B. Simonds;* salt-marshes, West Berkeley, *Burtt Davy*, no. 860; Alameda, October 3, 1898, *Setchell*. Patagonia: Rio Negro, 1838–42, *U. S. So. Pacific Expl. Exped.*

Var. **californica**, n. var. (fig. 2), foliis carneis lineari-oblanceolatis vel subspathulatis obtusis depressis vel rosulatis; scapis depressis vel arcuatis; seminibus 1.3–1.7 mm. longis.—Sonoma Co. to Monterey Co., California: Bodega Point, *Eastwood*, no. 4878; Point Reyes, *Burtt Davy*, no. 6794; Tennessee Cove, *Suksdorf*, no. 467; Fort Point, April, 1887, *E. L. Drew;* near San Francisco, 1865, *Torrey*, no. 418; Montara Point, June 5, 1903, *E. B. Copeland*, no. 3331 (type in Gray Herb.); Santa Cruz, April 15, 1897, *Setchell;* Pacific Grove, June, 1893, *Tidestrom*, July 8, 1914, *Gwendolen Newell;* along the beach, Point Pinos, *Heller*, no. 6755; Pescadero Ranch, near Monterey, *Brewer*, no. 647; Cypress Point, Monterey, *Eastwood*, no. 102.

In the herbarium of the Academy of Natural Sciences of Philadelphia there is a plant somewhat intermediate between typical *P. juncoides* and var. *californica* but rather nearer the latter (but with erect leaves) with the label: Salt Lake, Utah, *T. Meehan*, 1883. Further evidence of its occurrence in Utah is desirable.

Var. **decipiens** (Barnéoud), n. comb. Fig. 3. *P. decipiens* Barnéoud, Mon. Plantag. 16 (1845). *P. maritima*, in part, of Am. authors, not L.—Headlands, cliffs and dry beaches, chiefly or entirely above salt water, southern Labrador to New Jersey.—The following, from more than 100 numbers examined, may be cited as characteristic. Newfoundland: grassy cliffs above the harbor, St. John's, August, 1885, *R. Thaxter*; ledges of damp sea-cliffs, Torbay, *Howe & Lang*, no. 1376; gravelly and rocky sea-shore, Snook's Arm, *Fernald & Wiegand*, no. 6217; on rocks, Birchy Cove (Curling), *Fernald & Wiegand*, no. 4021. Quebec: Seven Islands, *C. B. Robinson*, no. 675; Cap Baleine, Anticosti, *Victorin*, no. 4207; sea-cliffs, Bonaventure Island, *Fernald & Collins*, no. 1177; dry limestone detritus, Cap Barré, Percé, August 16, 1904, *Collins, Fernald & Pease;* calcareous headlands by the River St. Lawrence, Grosses Roches, *Fernald & Pease*, no. 25,283; ledges by the St. Lawrence, Rivière Blanche, August 3, 1904, *F. F. Forbes;* rocky shores of the St. Lawrence, Temiscouata Co., July 26, 1878, *Pringle;* shaly headland by the River St. Lawrence, Berthier, *Fernald & Pease*, no. 25,282. Magdalen Islands: sandy bluffs, Grindstone, *Fernald, Long & St. John*, no. 8045; dry sandy summit of Great Bird Rock, *St. John*, no. 1987. Prince Edward Island: marshes near Tracadie Beach, July 29, 1901, *Churchill.*

NOVA SCOTIA: Point Prim, August 19, 1902, *M. A. Day;* turfy crest of headland, Markland, *Fernald & Long*, no. 24,511; gravelly sea-beach, Yarmouth Bar, *Fernald & Long*, no. 24,512. NEW BRUNSWICK: Restigouche, 1873, *Fowler;* dry gravel-pavement back of beach, Belledune Point, *Fernald & Pease*, no. 25,285; beach of Bay Chaleur, Grand Anse, *Blake*, no. 5532; sterile field on top of cliffs, Casey's Cape, Kent Co., July 9, 1914, *F. T. Hubbard.* MAINE: crevices of rocks by the sea, Cutler, July 13, 1901, *Kennedy;* dry ledges, Roque Bluffs, July 5, 1907, *Knowlton;* shore of pool, Great Cranberry Isle, August 30, 1892, *Rand;* rocky shores of Baker's Island, July 23, 1890, *Redfield;* rocky shore, Moore's Harbor, Isle au Haut, *Hill*, no. 1178; rocky shores and banks, Matinicus, July 20, 1919, *C. A. E. Long;* clefts of rocks, Round Pond, August 26, 1897, *Chamberlain;* among rocks, Georgetown, August 12, 1900, *H. M. Noyes;* crevices of rock above high tide level, Bowdoinham, *Fassett*, no. 210; crevices of ledges Orr's Island, *Chamberlain & Knowlton*, no. 577; on rocks, Scarboro, July 16, 1861, *Wm. Boott;* very dry soil and rock-crevices, Ogunquit, July 15, 1903, *Parlin.* NEW HAMPSHIRE: Appledore, Isles of Shoals, July 10, 1898, *C. H. Morss.* MASSACHUSETTS: Marblehead Neck, August, 1888, *E. H. Hitchings;* Beverly Bay, *Asa Gray;* rocks near shore, Nahant, September 6, 1857, *E. S. Hoar;* Nantasket Beach, July 18, 1884, *T. O. Fuller;* sea-shore sands, Cohasset, August 6, 1907, *Driggs.* RHODE ISLAND: rocks and fields, Newport, July 24, 1896, *M. B. Simmons;* rocks, Jamestown, June 26, 1897, *M. B. Simmons;* Narragansett Pier, July 28, 1891, *H. L. Merrow;* dry gravelly elevated beach, Grace Point, Block Island, *Fernald, Long & Torrey*, no. 10,421; clear dry gravel, top of high bluff, N. W. shore of Block Island, August 11, 1919, *C. B. Graves.* NEW JERSEY: Squam Beach, *J. W. Conrad* in herb. Acad. Nat. Sci. Phila.

Apparently hybridizes with *P. oliganthos.* Northward passes imperceptibly into the dwarf

Var. **glauca** (Hornem.), n. comb. FIG. 4. *P. maritima*, var. *glauca* Hornem. Oec. Pl. ed. 3, i. 167 (1821). *P. borealis* Lange, Fl. Dan. xvi. fasc. xlvi. 5, t. mmdccvii (1867). *P. borealis*, forma *pygmaea* Lange, Medd. om Grønl. iii. 259 (1886).—Greenland to Keewatin and Maine; Iceland and arctic Norway.—The following are typical. ICELAND: Seydisfjord, June 16, 1895, *Elizabeth Taylor.* GREENLAND: Godhaven, August 8, 1914, *Pedersen;* Atâ, August 6, 1921, *A. E. Porsild;* Ikertok Fjord, 1884, *Warming & Holm;* Ipintarssuaq, August 5, 1918, *M. P. & A. E. Porsild;* Itivneq, August 1, 1911, *M. P. & A. E. Porsild.* LABRADOR: Hopedale, *Sornborger*, no. 108; Makkovik Island, *Townsend*, no. 40; Sandwich Bay, August, 1902, *A. P. Brown;* rocks near sea, Battle Harbor, *C. S. Williamson*, no. 652; stony places, not maritime, Chateau, *J. A. Allen*, no. 80; rocks, Forteau, *Fernald & Wiegand*, nos. 4024, 4025; sea-shore rocks, Blanc Sablon, *Fernald & Wiegand*, no. 4023. NEWFOUNDLAND: dry

peaty pockets on limestone ledges, Flower Cove, *Fernald, Long & Dunbar*, no. 27,080; dry exposed ledges and shingle on the limestone tableland, Table Mt., Port à Port Bay, *Fernald & St. John*, no. 10,863; Fogo Island, August 7, 1903, *Sornborger;* rocky shore, Channel, *Howe & Lang*, 797, in part. QUEBEC: Bonne Espérance, *J. A. Allen*, no. 79; Natashquan River, August, 1912, *C. W. Townsend;* on gneissic rocks, 30 feet above high-water level, Tadousac, *Victorin*, no. 11; gravelly beach, St. Alphonse, Ha Ha Bay, Saguenay River, August 5, 1902, *Williams & Fernald;* crevices of ledge, Rivière du Loup, August, 1902, *Williams & Fernald;* calcareous sea-cliffs, Bonaventure Island, *Fernald & Collins*, no. 1178; gravelly beach, Paspébiac, July 27, 1902, *Williams & Fernald*. NOVA SCOTIA: Eastern Harbour, Cheticamp, *C. B. Robinson*, no. 414. NEW BRUNSWICK: dry headlands, Grande Anse, *Blake*, no. 5529. MAINE: top of cliff, Cutler, July 2, 1902, *Kennedy, Williams, Collins & Fernald;* crevices of ledges, Orrs Island, *Chamberlain & Knowlton*, no. 576. KEEWATIN: Churchill, *J. M. Macoun*, no. 79,369.

Var. **laurentiana** n. var. (FIG. 5), foliis lanceolatis vel oblanceolatis acutis vel subacutis 3–15 mm. latis, plerumque depressis vel rosulatis integris vel remote dentatis plerumque scapos arcuatos superantibus.—Newfoundland, Magdalen Islands, Prince Edward Island and Nova Scotia. NEWFOUNDLAND: Baccallieu Island, June 28, 1902, *Sornborger;* Funk Island, August 1, 1908, *H. S. Forbes;* cliffs, Placentia, *Robinson & Schrenk*, no. 70; calcareous cliffs and ledges, Cow Head, *Fernald & Wiegand*, no. 4022; wet sand, Stephenville Crossing, *Fernald & Wiegand*, no. 4026. MAGDALEN ISLANDS: dry sandy headland, Brion Island, *St. John*, no. 1986. PRINCE EDWARD ISLAND: dry sands, Wood Island, *Fernald & St. John*, no. 11,183. NOVA SCOTIA: Bay St. Lawrence, Cape Breton, August 15, 1904, *J. R. Churchill* (TYPE in Gray Herb.); crevices of red-sandstone cliffs, Sydney, August 18, 1902, *Fernald;* pebbly beach, Yarmouth, *Howe & Lang*, no. 40.

P. OLIGANTHOS Roem. & Schultes, Syst. iii. 122 (1818).—Two geographic varieties:

Leaves mostly erect or strongly ascending, in mature plants up to 12 mm. broad, mostly equaling or exceeding the erect scapes but usually overtopped by the mature spikes; the latter 0.3–2 dm. long, often remotely flowered at base . . Var. *typica*.
Leaves mostly loosely spreading or arching, slender, 0.5–4 mm. wide, mostly overtopping the spikes; scapes depressed or arched-ascending; spikes 0.5–7 cm. long, usually dense. . . . . Var. *fallax*.

P. OLIGANTHOS, var. **typica**. FIG. 6. *P. oliganthos* Roem. & Schultes, Syst. iii. 122 (1818), as to plant of New England and New Jersey. *P. pauciflora* Pursh, Fl. Am. Sept. i. 99 (1814), as to plant of New England and New Jersey, not Gilib. (1782) nor Lam. (1783). *P. maritima* Am. auth. in part, not L. *P. decipiens* Gray, Syn. Fl. N. A. ii. pt. 1: 390 (1878), not Barnéoud.—Salt-marshes and saline

or brackish shores, south shore of the River St. Lawrence, Quebec to New Jersey; also Manitoba. The following, selected from about 150 sheets, are typical. QUEBEC, Rivière du Loup, August 2, 1902, *Williams & Fernald;* York, August 25, 1904, *Collins, Fernald & Pease.* PRINCE EDWARD ISLAND: Brackley Point, *J. Macoun,* no. 16,877; Charlottetown, *Fernald, Long & St. John,* no. 8046. NOVA SCOTIA: Granville, *Fernald & Fassett,* nos. 24,114, 24,115; Atwood Brook, *Bartram & Long,* no. 24,513; Bridgewater, *Fernald & Long,* no. 24,516. NEW BRUNSWICK: Bathurst, *Blake,* no. 5374; St. Andrew's, July 27, 1900, *Fowler.* MAINE: Machiasport, August 30, 1898, *M. A. Barber;* Great Cranberry Isle, *Rand;* Hampden, *Fernald & Long,* no. 14,553; Westport, August 22, 1907, *I. W. Anderson;* Cumberland, *Chamberlain & Knowlton,* no. 536; Cape Elizabeth, July 23, 1889, *Fernald;* Kennebunkport, *Pease,* no. 1998; Wells, 1898, *Kate Furbish.* NEW HAMPSHIRE: Rye, September 19, 1901, *E. F. Williams.* MASSACHUSETTS: Plum Island, *D. White,* no. 144; Malden, July 19, 1887, *F. S. Collins;* Cambridge, 1857, *Gray;* Revere, *Young et al.;* Cohasset, August 6, 1907, *Driggs;* Pocasset, Bourne, *F. S. Collins,* no. 2637; Centerville, August 27, 1903, *Clara Imogene Cheney;* Osterville, September 6, 1896, *Williams;* Yarmouth, *Fernald & Long,* no. 19,106; Monomoy Point, August 27, 1879, *Brainerd;* Dartmouth, *Collins,* no. 2877; Tisbury, *Seymour,* no. 2015; Gay Head, August 2, 1897, *S. Harris;* Quaise, Nantucket, September 7, 1902, *Floyd.* RHODE ISLAND: Tiverton, *Greenman,* no. 1701; Providence, June, 1844, *Thurber;* Wickford, September 11, 1913, *C. F. Batchelder.* CONNECTICUT: Lyme, August, 1858, *D. C. Eaton;* Saybrook Point, *Blewitt,* no. 602; Milford, *Eames et al.;* Bridgeport, September 7, 1896, *Eames;* Greenwich, August 9, 1901, *Bissell.* NEW YORK: Long Island, *Torrey.* NEW JERSEY: Point Pleasant, August 8, 1908, *E. B. Bartram;* Brigantine, *C. E. Smith;* Atlantic City, *Diffenbaugh et al.;* Absecon, *F. L. Bassett et al.;* Absecon Beach, 1910, *C. H. LaWall;* Egg Harbor, *Nuttall;* Ocean City, *Stone, Fretz;* Palermo, July 26, 1909, *Van Pelt;* Wildwood, *Lippencott et al;* Five-mile Beach, September 25, 1900, *MacElwee.* MANITOBA: salt springs, Red Deer River, *J. Macoun,* no. 16,878.

Both Chas. Pickering and Thos. Nuttall had *P. oliganthos* separated in their herbaria as a new species, under manuscript names.

Var. **fallax**, n. var. (FIG. 7), foliis plerumque diffusis vel laxe arcuatis anguste linearibus 0.5–4 mm. latis spicis longioribus; scapis arcuatis; spicis 0.5–7 cm. longis plerumque densifloris.—Labrador and Newfoundland to eastern Maine.—LABRADOR: Mulligan Point, Lake Melville, July 25, 1891, *Bowdoin College Exped.,* no. 126 (TYPE in Gray Herb.); Middle Bay, July 29, 1882, *J. A. Allen,* no. 10. NEWFOUNDLAND: sea-shore, Flower Cove, July 12, 1921, *M. E. Priest;* muddy saline shores, near Frenchman's Cove, Bay of Islands, July 7, 1921, *Mackenzie & Griscom,* no. 10,436; sea-beach, Little

River, August 1, 1922, *Mackenzie & Griscom*, no 11,180; salt-marsh and brackish mud, Norris Arm, August 21, 1911, *Fernald & Wiegand*, no. 6218; salt-marsh, Killigrew's, August 3, 1911, *Fernald & Wiegand*, no. 6216. Quebec: shore of Esquimaux River, lat. 51°, 29′, July 27, 1882, *Allen*, no. 81; rocky beach, Ile des Genévriers, Archipel de St. Augustin, July 21, 1915, *St. John*, no. 90,731; gravelly beach, Carleton, July 21, 1904, *Collins & Fernald*. New Brunswick: salt-marsh, Bathurst, July 24, 1902, *Williams & Fernald* (transition to var. *typica*). Maine: wet rocks, Cutler, July 2, 1902, *Kennedy, Williams, Collins & Fernald* (transition to var. *typica*); Great Cranberry Island, July 17, 1897, *Williams*.

As already pointed out the name *P. oliganthos* is inappropriate for the long-spiked plant of New England and New Jersey, and particularly so in view of the northern var. *fallax* which actually has comparatively few flowers. The Labrador plant mentioned by Pursh as supplementing and belonging with the plant of New England and New Jersey, was presumably var. *fallax*, but the name *P. oliganthos* must be retained for the plant with linear-lanceolate leaves of New England and New Jersey, since that is what Pursh obviously intended. The name would better fit var. *fallax* but the Labrador element can hardly be taken as the *type* of Pursh's *P. pauciflora*.

Gray Herbarium.

Explanation of Plate 150

Fig. 1, *Plantago juncoides* × ¾, from Skagway, Alaska, *Eastwood*, no. 729. Fig. 2, *P. juncoides*, var. *californica* × ¾, from Montara Point, California, *Copeland*, no. 3331 (type). Fig. 3, *P. juncoides*, var. *decipiens* × ¾, from Cap à l'Aigle, Quebec, *Macoun*, no. 68,671; 3*a*, fruit × 10; 3*b*, seeds × 10 Fig. 4, *P. juncoides*, var. *glauca* × ¾, from Atâ, Greenland, *Porsild*. Fig. 5, *P. juncoides*, var. *laurentiana* × ¾, from Bay St. Lawrence, Cape Breton, Nova Scotia, *Churchill* (type). Fig. 6, *P. oliganthos* × ¾, from Greenwich, Connecticut, *Bissell;* 6*a*, fruit × 10; 6*b*, seeds × 10. Fig. 7, *P. oliganthos*, var. *fallax* × ¾, from Mulligan's Point, Lake Melville, Labrador, *Bowdoin College Exped.*, no. 126 (type).

NOMENCLATORIAL CHANGES FOR SOME CHINESE ORCHIDS.

H. H. Hu.

While working on my "Synopsis of Chinese Genera of Phaenogams with Descriptions of Representative Species," I have come across a number of Chinese orchids, the names of which should be changed according to the latest researches. In my book I am not following the International Rules of Botanical Nomenclature in retaining the Nomina Conservanda, but am using the oldest generic names since the publication of Linnaeus's Species Plantarum in 1753. However, in the present paper only those combinations are included which are in accordance with the International Rules.

Cordula esquirolei (Schlechter) Hu, comb. nov.

Paphiopedilum esquirolei Schlechter, Orchideol. Sino-Jap. Prod. 39 (1919).

R. A. Rolfe in a footnote in the Orchid Review XX. 2 (1912) pointed out that the generic name *Paphiopedilum* Pfitzer should be replaced by Rafinesque's *Cordula* which was published in his Flora Telluriana (1836). There are 3 species of *Paphiopedilum* recorded in China. Rolfe made the combinations needful for 2 of them, namely *C. purpurata* and *C. parishii*. Following him I propose the above combination for the third species.

Amesia discolor (Kränzlin) Hu, comb. nov.

Epipactis discolor Kränzlin in Fedde, Rept. xvii. 100 (1921).

Since A. A. Eaton pointed out in the Proceedings of the Biological Society of Washington, xxi. 63 (1908) that *Epipactis* (Haller) Boehmer was published earlier than *Epipactis* Adanson and should be used to replace *Goodyera* R. Brown, A. Nelson and J. F. Macbride in the Bot. Gaz. lvi. 472 (1913) proposed the name *Amesia* to replace *Epipactis* Adanson. In following these authors, I propose both the above and the following new combinations for the Chinese species of these two genera.

Amesia mairei (Schlechter) Hu, comb. nov.

Epipactis mairei Schlechter, Orchideol. Sino-Jap. Prod. 55 (1919).

Amesia monticola (Schlechter) Hu, comb. nov.

Epipactis monticola Schlechter in Meddel. fr. Göteb. Bot. Träg. I. 144 (1924).

Amesia royleana (Lindley) Hu, comb. nov.
Epipactis royleana Lindley in Royle, Illustr. 368 (1839).
Cephalanthera royleana Regel in Act. Hort. Petrop. vi. 490 (1879).
Limodorum roylcanum O. Kuntze, Rev. Gen. i. 671 (1891).

Amesia schensiana (Schlechter) Hu, comb. nov.
Epipactis schensiana Schlechter in Pax, Aufz. von Dr. Limpricht Pflanz. 347 (1923).

Amesia setschuanica (Ames & Schlechter) Hu, comb. nov.
Epipactis setschuanica Ames & Schlechter in Schlechter, Orchideol. Sino-Jap. Prod. 56. (1919).

Amesia squamellosa (Schlechter) Hu, comb. nov.
Epipactis squamellosa Schlechter, Orchideol. Sino-Jap. Prod. 56 (1919).

Amesia tangutica (Schlechter) Hu, comb. nov.
Epipactis tangutica Schlechter, Orchideol. Sino-Jap. Prod. 57 (1919).

Amesia tenii (Schlechter) Hu, comb. nov.
Epipactis tenii Schlechter in Fedde, Rept. xvii. 64 (1920).

Amesia wilsoni (Schlechter) Hu, comb. nov.
Epipactis wilsoni Schlechter in Fedde, Rept. xx. 382 (1924).

Amesia xanthophaea (Schlechter) Hu, comb. nov.
Epipactis xanthophaea Schlechter in Pax, Aufz. von Dr. Limpricht Pflan. 341 (1923).

Amesia yunnanensis (Schlechter) Hu, comb. nov.
Epipactis yunnanensis Schlechter, Orchideol. Sino-Jap. Prod. 57 (1919).

Epipactis chinensis (Schlechter) Hu, comb. nov.
Goodyera chinensis Schlechter, Orchideol. Sino-Jap. Prod. 59. (1919)

Epipactis labiata (Pampanini) Hu, comb. nov.
Goodyera labiata Pampanini in Nuov. Giorn. Bot. It. n. s. xvii. 246 (1910).

Epipactis mairei (Schlechter) Hu, comb. nov.
Goodyera mairei Schlechter in Fedde, Rept. xvii. 65 (1920).

Epipactis melinostele (Schlechter) Hu, comb. nov.
Goodyera melinostele Schlechter, Orchideol. Sino-Jap. Prod. 59 (1919).

Epipactis pauciflora (Schlechter) Hu, comb. nov.
Goodyera pauciflora Schlechter in Fedde, Rept. xii. 106 (1913).

Epipactis secundiflora (Lindley) Hu, comb. nov.
Goodyera secundiflora Lindley in Journ. Linn. Soc. i. 182 (1857).

Orchiodes secundiflora O. Kuntze, Rev. Gen. i. 675 (1891).

Epipactis yunnanensis (Schlechter) Hu, comb. nov.

Goodyera yunnanensis Schlechter, Orchideol. Sino-Jap. 60 (1919).

Pholidota yunpeensis Hu, nom. nov.

Pholidota yunnanensis Schlechter in Fedde, Rept. xx. 378 (1924), non Rolfe.

In naming this species Dr. Schlechter overlooked Rolfe's species published in Journ. Linn. Soc. xxxvi. 24 (1903). Since the latter is a valid species, this new homonym cannot be maintained, hence the proposed change.

Neofinetia Hu, nom. nov.

Finetia Schlechter in Beih. Bot. Centrbl. xxxvi. Abt. ii. 140 (1917), non Gagnepain.

There is a *Finetia* of the *Combretaceae* published by Gagnepain in Notulae Systematicae of the Herbier du Muséum de Paris iii. 278 (1916). This homonym should not be maintained, and a new name for this genus and a new combination for the following species are proposed.

Neofinetia falcata (Thunberg) Hu, comb. nov.

Orchis falcata Thunberg, Flor. Jap. 26 (1784).

Limodorum falcatum Thunberg in Trans. Linn. Soc. ii. 326 (1794).

Oeceoclades falcata Lindley, Gen. & Spec. Orch. 237 (1833).

Angraecum falcatum Lindley, Gen. & Spec. Orch. 237 (1833).

Vanda falcata Beer, Prakt. Stud. Orch. 317 (1854).

Oeceoclades lindleyana Regel, Ind. Sem. Hort. Petrop. 43 (1865).

Oeceoclades lindleyi Regel, Gartenfl. 70 (1866).

Angorchis falcata O. Kuntze, Rev. Gen. i. 651 (1891).

Angraecopsis falcata Schlechter, Orchid. 601 (1914).

Finetia falcata Schlechter in Beih. Bot. Centrbl. xxxvi. Abt. ii. 140 (1918).

CYPRIPEDIUM REGINAE IN NEW HAMPSHIRE.

Charles Schweinfurth

During September 1924, the writer saw a clump of the Showy Lady's Slipper, *Cypripedium reginae* Walt. (*C. hirsutum* of recent American authors, probably not Mill.) in the foot-hills of the White Mountains of New Hampshire. The exact location was a little

swamp in Campton, Grafton County, in about the middle of the state.

No New Hampshire records of this orchid appear in the Gray Herbarium, the Herbaria of Oakes Ames or of the New England Botanical Club, the three largest collections about Boston. But a reference to literature throws some light on the situation. Baldwin, in his "Orchids of New England" cites seven New Hampshire stations viz. Hanover, Lebanon, Franconia, Amherst, Crawford House, South Conway and West Concord. The two former localities are recorded by Jesup and are doubtless still extant, but a station at Concord (perhaps the West Concord locality of Baldwin) is cited as extinct by F. W. Batchelder. Moreover it is absent from Coös County.

What particularly interested the writer was that this orchid, usually a typical calciphile, should occur in a granite country. For certainly the plant association was anything but calcicole. Nearest the orchid grew *Vaccinium canadense, Carex crinita* var. *gynandra, Galium Claytonii, Coptis trifolia, Osmunda Claytoniana, Oakesia sessilifolia, Fragaria virginiana, Salix discolor, Gaultheria procumbens* and *Lycopus uniflorus*. Other parts of the swamp showed *Picea mariana, Epilobium densum, Trifolium agrarium, Salix sericea, Rhododendron canadense, Chiogenes hispidula, Osmunda cinnamomea, Acer rubrum*, the common Spiraeas and several common Solidagos. Several of these plants such as the Vaccinium, Gaultheria, *Picea mariana* and Rhodora typify the calcifuge group.

C. H. Hitchcock's Geology of New Hampshire shows, however, that a considerable strip of limestone occurs in the Connecticut River Valley some distance to the southwest of Campton. In addition he says that the glacial till from the northwest contains fragments of limestone which are scattered over the gneissic area to the southeast. Also the Franconia mountains, consisting chiefly of syenite, furnish calcium from their lime feldspars and lime micas. So the region appears to have some flavor of calcium. But the station here first recorded seems distinctly worth citing, for the Showy Lady's Slipper is rare and local in this New England State.

Three of the orchid stalks are close together and doubtless rise from a common corm. The fourth, distant several inches, is perhaps a separate plant. Altogether they present a fairly stocky growth, though apparently not so stout as late season plants from Berkshire

County, Massachusetts, or northern Vermont. Perhaps this is caused by an attempt, several years ago, to dig up the plants. When seen by the writer, one stalk had produced a single flower; two, a pair of blossoms; and one, three blooms. Three good capsules were ripening.

This orchid was discovered at the Hebron locality some twenty years ago (circa 1902) by Mrs. Andrew Morgan, through whose courtesy the station on her estate was revealed. Other parts of the same swamp failed to show any other Showy Lady's Slippers.

Wellesley Farms, Massachusetts.

THE AMPHIBIOUS GROUP OF POLYGONUM, SUBGENUS PERSICARIA.

E. E. Stanford.

I. Adaptation in Polygonum amphibium

The ecological adaptations in the old-world *Polygonum amphibium* L. have been known longer and studied in greater detail than those of the species of corresponding habit in America. The following brief review of the principal literature indicates the scope and results of the chief observations and researches centering round the adaptations of this plant.

P. amphibium is indeed a classic example of adaptability to diverse conditions. The aquatic form is conspicuous in the European water-flora, and is probably the Potamogeton of the ancients. Among pre-Linnean writers the description of Ray[1] has been usually cited as the oldest extant recorded observation of the terrestrial and aquatic forms. Both were described by Linnaeus,[2] though not directly referred to in the Species Plantarum (1753). More recent European writers have described a number of forms, which may apparently be reduced for the present purpose to three, referable to *P. amphibium* var. *natans* Moench, Enum. Pl. Hassk. 28 (1777); var. *terrestre* Leers, Fl. Herborn. 99 (1775); and var. *maritimum* Detharding, Consp. Pl. Magn. Megal. Phan. 33 (1828). The first is the typical floating form, with coriaceous floating or emersed leaves devoid of hair except for the margin, flowering abundantly; the second an upright land-adaptation, with short-petioled rough-hairy leaves, flowering rarely

[1] Ray, Historia Plantarum, i. 184 (1686).
[2] L. Fl. Suec. 115 (1745).

but perennating rapidly by rhizomatiform more or less creeping stems; and the third a reduced and extremely hairy form of sand dunes and similar arid habitat, flowering still more rarely, according to Massart[1] never.

These peculiarities of *P. amphibium* have inspired a number of later European investigations and notes. Irmisch[2] observed and described seed-germination and the development of the seedling, noted the quack-like spreading habit of the plant, and commented upon the rarity of its fruiting. He described its heterostyly and noted that in the long-styled form the anthers produced little or no well-developed pollen and usually shriveled without opening. He found no blooming plant on really dry ground.[3] He saw emersed plants with lower floating leaves of the type of var. *natans* and the upper foliage of var. *terrestre*. Hildebrand[4] submerged the terrestrial form, whereupon the leaves died and the rhizome put out other branches which formed floating leaves. Hildebrand also described the distribution of stomata, in air-leaves few above and many below; in floating leaves all on the upper surface. Hoffmann[5] repeated the experiment of Hildebrand, with similar results, but was unable again to produce the aquatic form from his plants with the induced terrestrial habit, even after they had been for two years transferred to two feet of water. Hoffmann also produced var. *maritimum* from var. *natans* by planting the latter in sand to which he added sodium chloride. An attempt to produce *P. aviculare* var. *littorale* from typical *P. aviculare* by similar means failed.

Schmidt[6] and Schenck[7] recorded observations on the assumption of the terrestrial form by formerly floating plants under the influence of drought. Constantin[8] made extensive anatomical studies of stem-

[1] Massart, *L'Accommotation individuelle chez Polygonum amphibium.* Bull. Jard. Bot. Brux. i. 72–88 (1902).

[2] Irmisch, *Ueber Polygonum amphibium*, etc. Bot. Zeit. xix. 105–109 (1861).

[3] Notes on the sterility of the land-forms constantly recur in the European literature, and similar observations are made concerning the terrestrial forms of the North America *P. natans.* Reduction of reproductive capacity following change of environment has perhaps attracted more attention among animals than plants, but the phenomenon exemplified by *P. natans* and *P. amphibium* is by no means an isolated one in the vegetable kingdom.

[4] Hildebrand, *Ueber die Schwimmblatter von Marsilia und einigen anderen amphibischen Pflanzen.* Bot. Zeit. xxviii. 17–23 (1870).

[5] Hoffmann, *Untersuchungen über Variation.* Ber. der Oberhessisch. Gesellsch. f. Natur u. Heilkunde. xvi. 1–37 (1877).

[6] Schmidt as quoted by Schenck, Massart and others.

[7] Schenck, *Die Biologie der Wassergewachse.* Verhandl. Naturhist. Vereines d. preuss. Rheinl. xlii. 217–280 (1885).

[8] Constantin, Ann. Sci. Nat. sér. 6, Bot. xix. 287–331 (1884); Bull. Soc. Bot. Fr. xxxii. 83–88 (1885); Ann. Sci. Nat. sér. 7, Bot. iii. 94–162 (1886).

structure, epidermal characters, and the leaf-structure of terrestrial and aquatic forms. He successfully repeated Hildebrand's experiment, using different portions of the same plant, which he planted in terrestrial and aquatic environments. Volkens[1] also investigated and figured the anatomical differences in the stem and leaf of aerial and water forms. His figures include an enlargement of the peculiar short stiff bristle-like hair that forms a striking characteristic of the European *P. amphibium* when contrasted with the longer and weaker ones of its American counterpart.

Massart[2] interested himself particularly in the xerophile form (*P. amphibium* var. *maritmum*). He carried on cultural experiments to prove that the three varieties were merely adaptive states which could be made to pass at will from one to the other. He figured cross-sections of the leaves and stems of aquatic and xerophile types, the epidermal, characters, and various types of hairs from the three forms.

As to the systematic rank of these well-known ecological forms, most European treatments term them varieties rather than formae. Moss[3] reduced the var. *terrestre* to formal rank, and inasmuch as this disposition seems best to accord with the systematic plan adopted in the International Code, in the taxonomic portion of the present study both the water- and land-adaptations of *P. amphibium* are treated as formae.

In addition to its adaptability to various habitats, it appears that the European plant—in common with a considerable number of other plants of that continent—is a rather more aggressive weed than its American relatives. Leers,[4] who found the terrestrial form growing "in cultis *in der Pitze & vor dem Homberg*" termed it vigorously "pessimum vitium." At a much later date Compton[5] reported a rather striking instance of the pioneering ability of the aquatic form. Twenty-four square miles of East Anglian fenland was flooded from January to October, 1915 so as

"to extinguish the centuries-old terrestrial flora . . . and to replace it by an aquatic flora derived from the waters of the drainage-channels . . . .

[1] Volkens, *Zur Kenntniss der Beziehungen zwischen Standort und anatomischen Bau der Vegetationsorgane.* Jahrb. König. Bot. Gart. Berl. iii. 1–46 (1884).

[2] Massart, l. c. (1902).

[3] Moss, Camb. Brit. Fl. ii. 115 (1914).

[4] Leers, Fl. Herborn. 99 (1775).

[5] Compton, *The Botanical Results of a Fenland Flood.* Journ. Ecol. iv. 15–17 (1916).

"*Cladophora flavescens* covered a very large proportion of the flooded area, acres at a stretch, either pure or mixed with *Polygonum amphibium*. The latter occurred in considerable abundance, rooting in the peaty soil, and producing branches often eight feet long (an indication of the depth of the flood) which bore fruit and seeded freely. In many cases these plants were so frequent that their leaves must have formed a thick coating to the water."

In this flooded area *P. amphibium* and *Alisma Plantago-aquatica* were the most abundant seed-plants.

(*To be continued.*)

The date of the May issue (unpublished as this goes to press) will be announced later.

A. E. Brackett del.

MARITIME PLANTAINS OF NORTH AMERICA.

Farlow Bot. Lab.

Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. July, 1925. No. 319.

OXALIS CORNICULATA AND ITS RELATIVES IN NORTH AMERICA.

K. M. Wiegand.

The taxonomy of the yellow flowered species of Oxalis has long been unsatisfactory and confused. Briefly summarized, the history of these plants is as follows. Linnaeus in 1753[1] described *O. corniculata* and *O. stricta*. *O. corniculata* was identified by subsequent European authors as the creeping plant of the Old World with which the name is now associated in Europe. *O. stricta* was early interpreted by European authors as the common cymose-flowered species of both Europe and America. In 1794 and 1796 Salisbury[2] proposed some new names for members of this group. One of these, *O. ambigua*, was for the plant known as *O. stricta*, another, *O. pusilla*, was plainly *O. corniculata*, and the third, *O. florida* will be discussed under that species. In the same year, however, Jacquin[3] proposed the name *O. ambigua* for a South African species, and since at present it is not possible to state which author proposed his name first, it is necessary to drop the name *O. ambigua* altogether. Also in 1794 Jacquin[4] described *O. Dillenii* "patria Carolina," based on the "O. lutea americana humilior" of Dillenius. In 1854 Jordan[5] suggested that the European *O. stricta*, so called, was not the *O. stricta* of Linnaeus, and proposed the name *O. europaea* for the plant. No definite description was given by Jordan and no definite synonyms except "(*stricta* auct.)," but there was a long running comment. However, the name has generally been considered to have been validly published.

[1] Sp. Pl. 435.

[2] Trans. Linn. Soc. ii. 242, (1794). Prodr. Stirp. Hort. All. 322 (1796).

[3] Oxal. 80 (1794).

[4] Oxal. l. c.

[5] In Schultz, Arch. Fl. Franc. et Allem 309 (1854).

In America before 1896 the name *O. stricta* was generally applied to the plant that bore that name in Europe; but *O. corniculata* was employed to cover both the creeping plant, our *O. corniculata*, and the erect or sub-erect one with strigose stems, our *O. stricta*. Only some of the early botanists, as for instance Elliott, clearly separated these two last mentioned plants. Trelease[1] in his treatment of the genus called the creeping form *O. corniculata* and the erect form var. *Dillenii*. In 1896 Small[2] first clearly showed that the name *O. stricta* must be applied to the erect strigose reflexed-fruited plant, as it was based on a Gronovian reference which in turn was based on a Clayton specimen now in the British Museum, and which is clearly this plant. To the plant until this time called *O. stricta* he gave the name *O. cymosa*. In 1906 Dr. B. L. Robinson[3] interpreted the Linnaean names somewhat differently. He held that the name *O. corniculata* should be applied to the cymose-flowered loosely hairy species called by Small *O. cymosa*, that the name *O. stricta* should be applied to the species to which Small had already ascribed it, while the name *O. repens* Thunb. should be employed for the creeping species heretofore called *O. corniculata*. This disposition of the names was followed in the seventh edition of Gray's Manual. In 1907 Schinz and Thellung[4] discussed the application of these names and decided in favor of the usage of the older authors, a position to which in the same year Britten and Rendle[5] took exception. In 1915 Wilmott[6] pointed out that according to his view Robinson's method of determining the Linnaean types was not in accord with the best practice, and that the name *O. corniculata* should be based on the cited figure of Morison, which represented the creeping plant. The question of which viewpoint is correct, that of Robinson or that of Wilmott, is very difficult to decide. Most of Linnaeus's references and the locality given very strongly suggest the creeping species. The opening statement might apply to either, while a specimen in the Hortus Cliffortianus herbarium is *O. europaea*. In view of the difficulty of making a correct decision it has seemed best to follow the interpretation of the earlier and most of the later authors, thus avoiding a change of name. On this basis the name *O. corniculata* should be applied to the creeping species.

[1] Mem. Bost. Soc. Nat. Hist. iv. 86 (1888), and Gray's Synopt. Fl. i. 365 (1897).
[2] Bull. Torr. Bot. Club xxiii. 265 (1896).
[3] Jour. Bot. xliv 386 (1906).
[4] Bull. Herb. Bois. 2 ser. vii 509–512 (1907).
[5] Jour. Bot. lxv. 436 (1907).
[6] Jour. Bot. liii. 172 (1915).

The earliest valid name for the plant called by Robinson *O. corniculata*, by early European authors *O. stricta*, and by Small *O. cymosa* seems to have been *O. europaea* Jordan as pointed out by Fernald and Robinson,[1] an unfortunate name as the plant is apparently a native of America from whence it became introduced into Europe where it is now a weed.

The above is a brief history of the two Linnaean names. The names for the other species treated in this paper are discussed under each species. The most recent monographer of the group is Small[2] who has proposed several new species for North America. Most of these new species the present writer has been unable to retain. There seem to be only a few specific types, but these are highly variable being made up of races which differ only in minor and apparently inconstant details, and between which are frequent intergradations. Variation is greatest in vegetative characters, and is occasionally so great that at first glance, the extremes may be mistaken for distinct species. Most of the variation in stature and foliage is without doubt due to environment, including soil conditions. It is very possible that the variations in pubescence are due to the same factor. In *O. europaea* the villous and strigose pubescence of stems and pedicels very likely respond to environment, but the hairs on the upper leaf surface seem more racial, with a tendency toward a definite geographical range and without transitional stages. The extent to which species are segregated in this paper into subordinate groups may appear to many as not adding to general utility, but it will give a better picture of the actual taxonomic conditions within this section of the genus Oxalis.

Small has placed much stress on the pubescence of the longer filaments. This character however does not seem to accord with other characters. The number of hairs also may be as low as two or even one, thus showing transition to glabrous forms. The filaments of some 150 specimens of *O. europaea* were examined by the writer with the result that in the form here considered typical *O. europaea* 14 of the western specimens had hairy and 8 glabrous filaments, while in 5 of the eastern the filaments were hairy as against 19 in which they were glabrous. The hairy filaments in this species are much more common in the region of Missouri and Illinois irrespective of the varieties and forms into which the species is divided. In other

[1] Gray Herb. Exsicc. no. 227.

[2] Fl. S. e. U. S. 666 (1903), and N. A. Flora, xxv. 49 (1907).

species the condition of the filaments was in most cases as stated by Small, but in several species there were frequent exceptions. In the heterogamic species a tendency for more hairy filaments in the short styled flowers was observed, but the observation was not verified. Seeds in Oxalis have not furnished many valuable taxonomic characters. A slight variation in size occurs between the seeds of some of the species, and also some difference in intensity and regularity of the markings, but the latter at least are generally not definite enough to be of value.

In the large flowered species a trimorphic condition of the stamens and styles is found (heterogamy). This condition was apparently first noted by Hildebrand,[1] and the biological relations worked out in an excellent series of papers. The phenomenon was also noted by Darwin[2] in his studies of heteromorphism in flowers. Later Trelease[3] and his students gave attention to the matter in a number of papers. The heterogamic condition has not been definitely detected in any of the small flowered species though the occurrence of long and short styled specimens of *O. filipes* and *O. florida* suggests that these two species may be heterogamic.

The present study is a result of difficulty in identifying specimens of Oxalis obtained in central New York. It is based chiefly on specimens in the Gray Herbarium, the New England Botanical Club and the herbarium of Cornell University. The study, though reasonably complete for northern and western North America is incomplete and only provisional as far as the southern United States, Mexico and the West Indies are concerned. The available material from these last named regions was insufficient.

a. Flowers 5–11 mm. long, apparently homogamous, or doubtfully so in Nos. 5 and 6; habit, stipules and pedicels various.
- *b*. Tap-root stout, thick, woody; plants loosely cespitose; rootstocks wanting; seeds 1.2–1.6 mm. long.
  - *c*. Styles 2.5–3.5 mm. long; sepals 4–7 mm. long; peduncles (25) 30–95 mm. long, slender and wiry as are also the petioles; leaflets usually thin; stipules narrow or almost obsolete; seeds 1.5–1.6 mm. long.
    - *d*. Leaflets hairy on the upper surface .... 1. *O. californica*.
    - *d*. Leaflets glabrous on the upper surface .... var. *subglabra*.
  - *c*. Styles 1–2.5 mm. long; sepals 3–5 mm. long; peduncles

[1] Monatsber. könig... preuss. Akad. Wiss. Berlin. 352 (1866), also Bot. Zeit. xxix. 415 (1871), and lxv. 17 (1887). Lebensverhältnisse der Oxalis Arten, Jena (1884).

[2] Dif. Forms of Fls. in Plants of same sp. (1877).

[3] Trans. Acad. Sci. St. Louis, v. 274 (1886) and 286 (1888). Mem. Bost. Soc. Nat. Hist. iv. 94 (1888).

10–40 (70) mm. long; stipules usually broad, rarely reduced; leaflets thickish.

d. Pubescence of stem and petioles appressed or subappressed; leaflets glabrous above; seeds 1.4–1.6 mm. long . . . . 2. *O. Wrightii.*

d. Pubescence spreading; seeds 1.2–1.5 mm. long.

e. Leaflets glabrous on upper surface . . . . var. *subpilosa.*

e. Leaflets hairy on upper surface . . . . var. *pilosa.*

b. Tap-root slender or wanting; plant often with running rootstocks; seeds 1.0–1.8 mm. long.

c. Stems (not rootstocks) creeping, generally brownish, from slender roots; stipules usually broad and brownish or purplish, subscarious.

d. Pubescence of stem and petioles more or less spreading.

e. Hairs of the capsule fine and dense, not viscid . . . 3. *O. corniculata.*

e. Hairs of the capsule or some of them looser and more or less viscid . . . . var. *viscidula.*

d. Pubescence strigose or substrigose; leaves numerous and petioles longer, very slender, giving a twiggy effect . . . . var. *Langloisii.*

c. Stems not truly creeping, erect or decumbent, often with creeping rootstocks; umbels and seeds various; stipules oblong, narrowly oblong or obsolete.

d. Flowers umbellate or solitary, rarely subcymose in No. 5 and No. 6; fruiting pedicels usually horizontal or deflexed but the capsules erect; plants with or without creeping rootstocks; hairs of the capsule, if any, fine and dense, substrigose (at least toward apex, sometimes glabrous below) or with additional villous viscid hairs.

e. Pubescence appressed or subappressed, whitish; capsules abruptly pointed, 8–25 mm. long; sepals 2–7 mm. long; styles usually short.

f. Capsules crisp-hairy and hoary throughout, (10) 15–25 mm. long; sepals (3.5) 4–7 mm. long; plants mostly rather stout, rarely with rootstocks or stolons.

g. Pubescence of the capsule with some loose subvillous viscid hairs . . . . 4. *O. stricta.*

g. Pubescence of the capsule appressed, nonviscid . . . . var. *piletocarpa.*

f. Capsule crisp-hairy or strigose toward the apex, otherwise glabrous, 8–12 mm. long; sepals 2.5–4.5 mm. long; plants very slender and wiry, often with creeping rootstocks . . . . . . 5. *O. filipes.*

e. Pubescence toward base of stem loosely crisped, tawny; capsules strigose toward apex, glabrous below, rarely strigose throughout, 9–15 mm. long, gradually pointed; sepals 4–4.5 mm. long; styles generally long and slender, less commonly short; plants with rootstocks.

f. Leaflets glabrous above . . . . 6. *O. florida.*

f. Leaflets hairy on upper surface . . . . f. *strigosifolia.*

d. Flowers cymose on well-developed plants; fruiting pedicels spreading or ascending; stipules nearly obsolete; plants producing long slender horizontal rhizomes; capsules conical or conic-oblong, with scattered spreading viscid hairs or glabrate.

e. Upper surface of the leaves glabrous.
f. Hairs of the pedicels appressed, scarcely viscid.
g. Stem with ascending pubescence or glabrate . . . 7. *O. europaea.*
g. Stem villous . . . . f. *pilosella.*
f. Hairs of the pedicels spreading, usually viscid.
g. Stems nearly or quite glabrous . . . . f. *cymosa*
g. Stem villous . . . . f. *villicaulis.*
e. Upper surface of the leaves with scattered hairs.
f. Hairs of the pedicels appressed, scarcely viscid.
g. Stems villous . . . . var. *Bushii.*
g. Stems with ascending pubescence or glabrate . . . f. *subglabrata.*
f. Hairs of the pedicels spreading, usually viscid; stem villous. . . . . f. *vestita.*
a. Flowers 12–20 mm. long, apparently trimorphic as to relative length of stamens and styles (heterogamous); plants from creeping rootstocks; stipules small or obsolete; pedicels often widely spreading but not reflexed.
b. Leaflets 20–50 mm. wide, usually with a very narrow purple margin; stems 20–50 cm. high; calyx and capsule sparsely and minutely villous and viscid. . . . . 8. *O. grandis.*
b. Leaflets 5–20 (25) mm. wide, without a purple margin; stems 5–18 cm. high; capsule closely puberulent, not viscid; calyx puberulent or villous, usually nonviscid.
c. Peduncles not exceeding the subtending leaves; capsules ovoid, 7–10 mm. long; seeds 2.0–2.4 mm. long; umbels 1–2-flowered; leaflets rather large and thin, 10–20 mm. broad, with scattered hairs on both surfaces . . . . 9. *O. Suksdorfii.*
c. Peduncles exceeding the subtending leaves; capsules cylindrical, 10–20 mm. long; seeds 1.4–1.5 mm. long; umbels 2–7-flowered; leaflets 11 mm. broad or less.
d. Peduncles conspicuously exceeding the leaves; stems rather strictly erect from the rootstocks.
e. Pubescence of pedicels appressed; corolla glabrous; leaflets usually glabrous on upper surface.
f. Hairs on the stem spreading . . . . 10. *O. recurva.*
f. Hairs on the stem ascending or appressed. . . . . var. *texana.*
e. Pubescence of pedicels and stem spreading, that of the latter shaggy; corolla more or less hairy outside.
f. Leaflets glabrous above . . . . var. *macrantha.*
f. Leaflets hairy on both surfaces . . . . f. *sericea.*
d. Peduncles slightly exceeding the leaves; rootstocks less evident and stems more diffuse at base . . . . var. *floridana.*

1. O. californica (Abrams) Knuth, Notizbl. kön. bot. Gart. u. Mus. vii. 300 (1919). *Xanthoxalis californica* Abrams, Bull. Torr. Bot. Club, xxxiv. 264 (1907), and Small, N. A. Flora, xxv. 54 (1907).—Stems decumbent, sparingly pubescent with subappressed hairs or glabrate; petioles slender 3–8 cm. long, substrigose; leaflets 10–17 mm. broad, hairy on both faces; peduncles often exceeding the leaves, strigose; umbels usually 2-flowered; pedicels 10–40 mm. long, strigose, spreading, scarcely reflexed; flowers apparently homogamous; petals about 11 mm. long, pale yellow or purplish, glabrous; filaments subglabrous; capsule cylindrical, 10–15 mm. long, closely puberulent,

acuminate.—Dry hillsides: Santa Barbara, California to Lower California and eastward to Coahuila, Mexico. Specimens examined: California: Santa Barbara, *W. N. Suksdorf*, no. 221; Los Angeles, *Hasse;* Monrovia, *A. Eastwood*, no. 4175; San Diego County, *L. Abrams*, no. 3274, and *Clara E. Cummings;* Oceanside, *S. B. Parish*, no. 4442. Lower California: All Saints Bay, *Miss F. E. Fish;* Ensenada, *A. W. Anthony*, no. 184. Mexico: Saltillo, Coahuila, *E. Palmer*, no. 135; Soledad, Coahuila, *Palmer*, no. 134 and 135.

Var. **subglabra** var. nov. Foliolis pagina superiori glabris. Leaflets glabrous on the upper surface. Northern Mexico. Specimens examined: El Taste, Lower California, *T. S. Brandegee:* Chihuahua, *C. G. Pringle*, no. 1204 (Type in Gray Herb.); Nuevo Leon, *C. G. Pringle*, no. 8738.

The long lower petioles and peduncles in this species give a twiggy effect not evident in *O. Wrightii.*

2. O. Wrightii Gray, Pl. Wright. i. 27 (1852). ? *O. albicans* HBK. Nov. Gen. et Sp. v. 244 (1822).—Stems decumbent, pubescent with fine ascending or subappressed hairs or glabrate; petioles mostly 1–4 cm. long, loosely strigose; leaflets small or medium, 4–15 mm. wide, pale, glabrous above, hairy or glabrate beneath; peduncles short, about equaling the leaves, loosely strigose; umbels 1–3-flowered; pedicels 5–20 mm. long, widely spreading or slightly deflexed; flowers apparently homogamous; petals about 10 mm. long, yellow or purple, glabrous; filaments subglabrous; capsules cylindrical, 12–20 mm. long, closely puberulent, rather abruptly acute.—Jackson County, Missouri (?), Texas, New Mexico and Arizona, southward to southern Mexico. Some specimens examined: Missouri: Jackson County, 1888, *F. Bush* (identification uncertain). Texas: Fort Davis, *Dr. Girard;* Limpia, *Sutton Hayes*, no. 95. New Mexico: *C. Wright*, no. 907. Arizona: Reed's Ranch, Cave Creek, *J. C. Blumer*, no. 1547. Mexico: Sonora, *G. Thurber*, no. 1079; Zacatecas, *Dr. Coulter*, no. 773 and near Concepcion del Oro, *E. Palmer*, no. 292; Durango, *E. Palmer*, no. 5; San Luis Potosi, *J. G. Schaffner*, no. 761, and *Palmer*, no. 651; Jalisco, near Guadalajara, *Pringle*, no. 11323; Federal District, near Tlalpan, *Pringle*, no. 8523, Eslava, *Pringle*, no. 11942, Tacubaya in Vallée de Mexico, *Bourgeau*, no. 1026; Oaxaca, Telixlahuaca, alt. 6000 ft., *L. C. Smith*, no. 514.

Var. **subpilosa**, var. nov. Ab var. pilosa recedit foliolis pagina superiori glabris. Differs from var. *pilosa* in the glabrous upper surface of the leaves.—Central and north central California. Specimens examined: Fort Bragg, Mendocino County, *A. Eastwood*, no. 1610; east of Napa, *W. N. Suksdorf*, no. 768 (Type in Gray Herb.); Ashland, Sacramento County, *H. Mann;* San Francisco, *J. W. Blankinship;* Nobel near Berkeley, *Suksdorf*, no. 406; near San Bruno, San Mateo County, *Suksdorf*, no. 356; Santa Lucia Mts., Monterey County, 1885, *T. S. Brandegee.*

Var. **pilosa** (Nutt.) comb. nov. *O. pilosa* Nutt. in Torr. & Gray Fl. N. A. i. 212 (1838); Small, Bull. Torr. Bot. Club, xxiii. 457 (1896). ? *O. corniculata* var. ? *micrantha* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 88 (1888) as to California plants. *O. pumila,* in part, Trelease in Gray's Synopt. Fl. i. 366 (1897). *Xanthoxalis pilosa* Small, N. A. Flora xxv. 54 (1907).—Pubescence of the stem spreading; leaflets hairy on both surfaces; seeds 1.2–1.5 mm. long. California, from Sonoma County southward; also in Arizona and northwestern Mexico. Specimens examined: California: south of Healdsburg, Sonoma County, *Heller & Brown,* no. 5237; near Crystal Springs, San Mateo County, *W. N. Suksdorf,* no. 395; Santa Cruz, *C. F. Baker,* no. 1968; Santa Lucia Mountains, Monterey County, *R. A. Plaskett,* no. 35; Pacific Grove, 1903, *Heller;* near Santa Barbara, *A. Eastwood,* no. 180, and *L. Abrams,* no. 4110; near Pala, San Diego County, *S. B. Parish,* no. 4397. Arizona: Lowell, *W. F. Parish,* no. 32; Prescott, *E. Palmer,* no. 54. Mexico: Oputo, Sonora, *C. Lumholtz,* no. 200.

The writer has been unable to find good specific characters to separate *O. Wrightii* and *O. pilosa.* The seeds average somewhat smaller in *O. pilosa,* which fact when combined with the difference in pubescence suggests a real racial difference of greater importance than mere fluctuation in pubescence alone, yet the characters all overlap. The var. *subpilosa* bridges over the differences in pubescence. The name for this species is in some doubt. Humboldt, Bonpland and Kunth described *O. albicans* and *O. verticillata,* both from Mexico. The very full description of *O. albicans* agrees well with the present species except as to the statement "Filamenta . . . longiora puberula" and "styli . . . stamina superantes," to which De Candolle added, "stylis longissimis." Since in the present species the filaments are almost always glabrous and the styles short, and since these are rather fundamental characters in separating *O. Wrightii, O. californica* and other species, the writer has found himself too much in doubt regarding the identity of *O. albicans* to displace the well-known name *O. Wrightii* Gray. The identity of *O. verticillata* cannot be determined without recourse to Humboldt's specimen.

3. O. corniculata L. sp. Pl. 435 (1753), most European authors and Trelease in Mem. Bost. Soc. Nat. Hist. iv. 88 (1888) and Gray's Synopt. Fl. i. 365 (1897). *O. repens* Thunb. Oxal. 16 (1781), and Robinson & Fernald in Gray's Man. ed. 7, 534 (1908). *O. pusilla* Salisb. Trans. Linn. Soc. ii. 243 (1794), not Jacq. Oxal. (1794). *Xanthoxalis corniculata* Small, Fl. S. e. U. S. 667 (1903), and other synonyms. —Stems from a slender tap-root, pubescent with rather loose more or less crisped tawny hairs or glabrate; petioles slender, with spread-

ing pubescence; leaflets glabrous above or very rarely with a few hairs, sparingly hairy beneath, more or less glaucous and often purplish; umbels 2–several-flowered, rarely 1-flowered; peduncles from shorter than to somewhat longer than the leaves, loosely pubescent; pedicels generally short, 4–15 (20) mm. long, at length deflexed; flowers usually small, homogamous, 4–8 mm. long; calyx 2.5–4 (5.5) mm. long; filaments usually glabrous; mature capsule cylindrical or prismatic, 8–15 (26) mm. long, abruptly acute, evenly and closely puberulent with nonviscid hairs; beak and styles short, 1–3 mm. long; seeds mostly 1.2–1.4, rarely 1.8 mm. long.—Occasional as an introduced weed in and around greenhouses in the eastern and Pacific United States, but apparently common in the warmer regions of the world. Specimens have been examined from the following states and countries: Massachusetts, Connecticut, Pennsylvania, District of Columbia, Oregon, Mexico, Bermuda, Nassau, Cuba, Jamaica, Venezuela, Bolivia, Galapagos Islands, Ascension Island, Teneriffe, Azores, Spain, Italy, France, Germany, Jersey, Afghanistan, northern India, Japan, Isle de Pascale, and Australia.

Var. **viscidula** var. nov. ? *O. herpestica* Schlecht. Linnaea xxvii. 525 (1854). Capsulis subvillosis subviscidis. Capsules with some long villous more or less viscid hairs among the short ones. Habitat and range much as in the typical form, but more common in Asia, the Pacific Islands and Australia than elsewhere; apparently rare in Europe and infrequent in warmer America. Specimens have been seen from the following regions: Maine, Vermont, Massachusetts, Connecticut, New York, Missouri, South Dakota, Oregon, Nassau, St. Vincent, Trinidad, Columbia, St. Helena, northern India, China, Hawaii, Philippines, Australia, and New Zealand. (Type in Gray Herb.; Northampton, Massachusetts, 1902, Mrs. E. H. Terry.)

Var. **Langloisii** (Small) comb. nov. *Xanthoxalis Langloisii* Small, Fl. S. e. U. S. 667, 1332 (1903). *Oxalis Langloisii* Fedde in Just's Bot. Jahresb. xxxii. pt. 1. 410 (1905).—Slender with longer very slender and more numerous petioles and usually longer and more filiform pedicels; capsules generally nonviscid. Through the southern United States from the District of Columbia to Texas, and in Cuba. Specimens examined District of Columbia: banks of the Potomac, *F. Peck* (old Gray Herb. specimen). Virginia: Clifton Forge, *E. S. & Mrs. Steele*, no. 1. Florida: Hillsborough County, *A. Fredholm*, no. 6258. Oklahoma: Harmon County, *G. W. Stevens*, no. 1077. Texas: near Texarkana, *A. A. & E. G. Heller*, no. 4241. Cuba: *C. Wright*, no. 56; Pinar del Rio, *P. Wilson*, no. 9377.

This is the most widely distributed of the species here considered, and in different parts of its range is highly variable. These variations have been described by various authors, sometimes as varieties but more often as species, until the synonymy is very complex. Much of the variation in stature, and in size of the umbel, is due here, as in

the other species, to fluctuations in water supply, soil and exposure. In some regions there are large-flowered long-capsuled and large-seeded forms, and these have been introduced into America to the extent of at least one specimen from Connecticut and one from Oregon. In the Pacific Islands and in Australia very delicate plants occur which are evidently affiliated with *O. corniculata* but are not exactly identical with this species as it occurs in Europe and America. Most of the European specimens of *O. corniculata* studied had nonviscid capsules, and therefore this form has been taken as typical. The variation in pubescence of the capsule has not been correlated with environmental changes, and to some extent seems to be geographical. For these reasons the form with villous viscid capsules is here treated as a named variety. The typical form of the species and the var. *viscidula* sometimes resemble the more prostrate forms of *O. stricta*, but the smaller capsules, broader and browner stipules and spreading tawny pubescence of the stem usually render their identification certain.

The var. *Langloisii* does not seem specifically distinct, as transitional specimens occur. This variety closely resembles the more prostrate forms of *O. filipes* but the nonviscid capsules are evenly puberulent throughout. The var. *Langloisii* is less plainly creeping than is the typical form and var. *viscidula*. In the Cuban specimens of var. *Langloisii* the leaves are strigose above and the plants are very slender. More material may show this Cuban form to be a definite variety. In all the specimens of var. *Langloisii* seen by the writer the filaments were glabrous, not hairy as stated by Small. The specimens from Oklahoma and Texas though prostrate appear not to root. More material may show this variety to be a complex.

4. O. stricta L. Sp. Pl. 435 (1753), Britton & Brown, Ill. Fl. N. U. S., Robinson & Fernald in Gray's Man. ed. 7, Small, Bull. Torr. Bot. Club, xxiii. 265 (1896). *O. Dillenii* Jacq. Oxal. 28 (1794), DC. Prod. i. 691 (1824). *O. Lyoni* Pursh, Fl. Amer. Sept. i. 322 (1814), Elliott, Sk. Bot. S. C. and Ga. i. 527 (1821). ? *O. furcata* Ell. l. c. *O. Navieri* Jord. in Schultz, Arch. Fl. Fr. et Allem. 310 (1854). *O. corniculata* var. *Dillenii* Trelease in Gray's Synopt. Fl. i. 365 (1897). *Xanthoxalis stricta* Small, Fl. S. e. U. S. 667 (1903), and N. A. Flora.—Plant pale; stems from a slender tap-root, often branched at base, erect or ascending, occasionally decumbent and rooting below; stipules oblong, rather firm and pale, larger on prostrate stems; petioles strigose; leaflets 10–18 mm. wide, glabrous above, glabrous or substrigose beneath; peduncles usually exceeding the leaves, strigose;

umbels 2–3-, rarely 1- or 4-flowered; pedicels 8–25 mm. long, more or less deflexed in fruit, strigose; flowers 7–11 mm. long, homogamous, corolla glabrous; filaments generally glabrous; capsules evenly cylindrical, large, abruptly short pointed, finely puberulent and canescent with some long viscid hairs intermixed; styles short; seeds 1.0–1.3 mm. long, sharply marked. Prince Edward Island to British Columbia, southward to Florida, Texas and Mexico, also in Bermuda; apparently absent from the Pacific Coast States.

Var. **piletocarpa** var. nov. Capsulis dense adpresso-puberulis canescentibus eviscidis. Capsules finely and densely appressed puberulent, canescent, nonviscid.—Prince Edward Island southward to New Jersey, also in Wyoming, and introduced into Europe. Not as common as the typical form on the Coastal Plain or in the Mississippi Valley. (Type in Gray Herb., "Old gravel pit," Alstead, New Hampshire, 1901, E. F. Williams.)

This is the only species, exclusive of those with thick roots or creeping stems, in which rootstocks and stolons are not developed. The form with villous hairs on the capsule was taken as typical of the species because the Clayton type came from a region from whence all the specimens seen had villous capsules. Also, *O. Dillenii*, which is generally regarded as a synonym of *O. stricta*, was described as having villous capsules. The identity of *O. Dillenii*, however, is not very clear. A specimen was not seen by Jacquin, the species being based on a description and figure of Dillenius.[1] Both Dillenius' description and figure indicate a villous stem, and as stated above the capsule is represented as villous. Dillenius' description of the capsule was "molli & subincana hirsuta." The figure has a strong resemblance to *O. stricta* as to general appearance, habit, root, umbel and capsules, which latter are shown as long and abruptly pointed as in *O. stricta*. Many early authors recognized these two species as identical. More recent authors, especially in Europe have interpreted *O. Dillenii* as an erect variety of *O. corniculata*.

In the Gray Herbarium there are three specimens of *O. stricta* (all var. *piletocarpa*) from Europe as follows: near Limoges, France, 1868, *F. Schultz*, Herb. norm., no. 841 bis; Venice, Italy, 1909 and 1912, *A. Fiori & A. Beguinot*, no. 1324 and 1324 bis. When and how widely this species was introduced into Europe is not known to the writer. It was evidently growing in the Eltham garden in the time of Dillenius, but seems not to have spread as did *O. europaea*. Our limited knowledge of it may be due to the fact that most European

[1] Hort. Elth. ii. 298, t. 221 (1732).

authors have included it in *O. corniculata*. No specimens have been seen by the writer from any other portion of the Old World.

5. O. filipes Small in Britton & Brown's Ill. Fl. N. Sta. and Can. ed. 1. ii. 346 (1897), not of Gray's Man. ed. 7. *Xanthoxalis filipes* Small, F. S. e. U. S. 667 (1903).—Stems erect or decumbent, slender, wiry, sparsely pubescent or glabrate; stipules nearly obsolete; petioles very slender, substrigose; leaflets rather thin, 12 mm. wide or less, glabrou or more or less hairy beneath; peduncles filiform, exceeding the leaves; flower clusters 2–5-flowered, umbellate or subcymose; pedicels 6–15 (22) mm. long, filiform, sparsely strigose; flowers 7–10 mm. long heterogamous (?); corolla glabrous; filaments pubescent or rarely glabrate; capsule evenly cylindrical, abruptly pointed; styles about 2 mm. long, rarely longer; seeds 1.0–1.2 mm. long, usually not all in each capsule developed.—Chiefly in dry sandy soil: Connecticut to Florida, mainly near the coast. Specimens examined: Connecticut: Orange, *E. H. Eames*, no. 60. New Jersey: Ocean County, *A. Gershoy*, no. 400; Fort Lee, 1901, *E. E. Magee*. Pennsylvania: Lancaster County, 1901, *A. A. Heller*. District of Columbia: ?, 1899, *E. S. Steele;* Oakwood Heights, *T. A. Williams*. Maryland: Glen Sligo, 1899, *T. A. Williams, W. R. Maxon*. Virginia: near Luray, *E. S. & Mrs. Steele*, no. 120; Fairfax County, *L. F. & F. R. Randolph*, no. 167 (Cornell Herb.). Tennessee: Wolf Creek, 1894, *T. H. Kearney*. Georgia: Charlton County, *A. H. Wright*, no. 531 (Cornell Herb.). Florida: Indian River, *E. Palmer*, no. 67; Lee County, *A. S. Hitchcock*, no. 35, and *Jeanette P. Standley*, no. 188; Lake County, *G. V. Nash*, no. 118.

O. filipes and *O. florida* have much the appearance of hybrids between *O. europaea* and either *O. stricta* or *O. corniculata*, as no new characters are found in either species. The frequency of their occurrence in the east and absence in the west where the possible parents both occur is against this hypothesis. The styles in both species are either long or short, though in very unequal numbers, suggesting a heteromorphism of the flower.

(*To be continued.*)

THE AMPHIBIOUS GROUP OF POLYGONUM, SUBGENUS PERSICARIA.

E. E. Stanford.

(*Continued from p. 112.*)

II. The American Amphibious Persicarias.

The systematic position of the semi-aquatic or amphibious members of the genus *Polygonum* in America has long been a vexed question. The existence of at least two species, each varying widely in its characters in accordance with its ability to maintain itself in most diverse situations, has been generally recognized. One of these is generally cited as identical with the *P. amphibium* L. of Europe; the other as *P. Muhlenbergii* (Meisn.) Wats. or *P. emersum* (Michx.) Britton. Besides these, the existence of some 45 species less generally recognized has been asserted by Greene, Nieuwland and others.

In advance of the somewhat lengthy discussion necessary to present the point of view in its entirety, and to indicate the trend of the discussion itself, it may be said that the proposition advanced by the portions of this paper dealing with the systemy and floral characters of the amphibious Polygonums is to indicate the existence on this continent of two principal species: one, to be referred to as *P. natans* (Michx.) A. Eaton, much resembling but not identical with the European *P. amphibium* L.; the other as *P. coccineum* Muhl., which in the opinion of the writer is an earlier valid binomial disignation of the plant generally called *P. Muhlenbergii* (Meisn.) Wats. and *P. emersum* (Michx.) Eaton. It has previously[1] been advanced as a conjecture supported by a certain amount of presumptive evidence that the great variability manifested by these plants, which has caused so much uncertainty as to their positions and identities, is due not only to their unusual adaptability to varied conditions of habitat—factors which certainly play no small part in the situation—but also, in some sections of the country at least, to more or less frequent cross-breeding between two species closely related and, as compared with the majority of their congeners, unusually adapted to cross-fertilization; the results of these crossings being seen in individuals in which the parental characters are more or less blended, and which have a faculty less strongly developed in other groups of the genus of perennating to

[1] Stanford, Rhodora, xxvii. 81–89 (1925).

a practically unlimited extent by means of rhizomes and rhizomatic stems, while their flowers show a percentage of sterility which is almost unique among the well recognized species of *Polygonum*. Inasmuch as the final proof of this conjecture may be considered to require further studies which are beyond the scope of the present paper, it is not proposed, on the basis of that speculation, to change the rank or nomenclature of any member of the group which has recognizably distinct characters and demonstrated range. As to the existence of *P. amphibium* on American shores, it may be said that a single Nova Scotian specimen in the Gray Herbarium shows the existence of a colony (doubtless introduced) in that province, and it is not improbable that if collectors take cognizance of the characters by which *P. amphibium* may be differentiated, other stations may be discovered. For that reason, as well as the necessity of establishing the position of *P. natans* in American *Polygonum* history, some attention will be devoted to the European species in the discussion which follows.

In view of the great variability, whatever its cause, existing in these plants, it is no wonder that the accounts of the early American floristic writers are, in their brevity, often unsatisfactory, or that these writers themselves occasionally used a term applicable to one species to designate the other. The following resumé is not intended to be encyclopedic, but merely to indicate the points of view of the principal writers who have described these plants and to trace as far as possible the identity of the material to which reference was made.

Walter[1] notes as "P. Bistorta?" a plant which Pursh[2] and Meisner,[3] the former doubtfully, refer to that here treated as *P. coccineum*. The "floribus albis" of Walter appears rather a serious discrepancy; Elliott in 1817 referred Walter's problematical plant to *P. virginianum* L.; this, in view of the white flowers and the territory covered by Walter's work, seems a more probable conjecture. Michaux[4] under *P. amphibium* L. described

"Var. α. *natans:* foliis natantibus, oblongo-ovalibus: spica ovoidea, glabra.
—β. *emersum:* foliis ovali-lanceolatis, erectis, minutim pubentibus: spica oblonga.

[1] Walter, Fl. Carol. 131 (1788).
[2] Pursh, Fl. Am. Sept. i. 271 (1814).
[3] Meisn. Mon. Gen. Polyg. Prodr. 67 (1826) and in DC. Prodr. xiv. 116 (1856).
[4] Michx. Fl. Bor.-Am. i. 240 (1803).

Hab. α. in lacu *S. Joannis.*
β. ad ripas fluminis *Ohio.*"

Here we have succintly the typical form of each of the two principal American species: *P. natans* (Michx.) Eaton, with its floating glabrous leaves and short panicles, and *P. coccineum* Muhl., with pubescent lanceolate leaves and longer panicles.

Willdenow[1] as a footnote under *P. amphibium* L. inserted the following:

"Similis species in America boreali etiam amphibia occurrit.
POLYGONUM *coccineum.*
P. floribus pentandris semidigynis, spica cylindracea, ochreis truncatis glabris, foliis ovatis.
Polygonum coccineum *Mühlenberg in litt.*
α. *aquaticum* foliis ovato-ellipticis obtusis.
β. *terrestre* foliis ovato-oblongis acuminatis.
Habitat in Pennsylvania. ♃.
Folia varietatis terrestris tripollicaria et sesqui pollices fere lata. *Spica* coccinea bipollicaris cylindrica."

Polygonum coccineum Muhl., then, is to be considered the first published binomial, and therefore valid for the plant with ovate-lanceolate leaves and cylindric panicle, later reduced by Meisner[2] to *P. amphibium* var. *Muhlenbergii,* raised again to specific rank by Watson.[3] For this plant also Michaux's varietal name was combined as *P. emersum* by Britton.[4]

The "var. α *natans*" of Michaux resembles very closely the aquatic form of the *P. amphibium* of Europe, and by most authors has been considered identical with it. Amos Eaton[5] published

"*Polygonum natans* (floating knotweed. Whiting's Pond. r. Au. ♃.) stamens 5: styles 2, or half 2-cleft: leaves lanceolate, glabrous, near the tops of the stem; petiole filiform, half as long as the leaf: stipules not ciliate: peduncle of the spike smooth: stem very long, lax, filiform, submersed-floating, leafless under water and rooting. Stems generally brown, often 10 to 15 feet in length and from the eighth to the sixteenth part of an inch in diameter; though generally larger and not so long. It is the P. amphibium. Var natans of Mx. and a variety of the coccineum of Willdenow. But it appears suffici ently distinct for a species. It grows plentifully in Whiting's Pond 5 miles south of New-Lebanon springs [N. Y.]."

[1] Willd. Enum. Pl. 428 (1809).
[2] Meisn. in D.C. Prodr. xiv. 166 (1856).
[3] Watson, Proc. Am. Acad. xiv. 295 (1879).
[4] Britton, Trans. N. Y. Acad. Sci. viii. 73 (1889).
[5] Eaton, Man. ed. 3: 400 (1822).

This description appears unchanged in Eaton's 4th edition (1824). In the 5th (1829) Eaton for the first time admitted:

"*amphibium* L. . . . upper leaves sub-sessile and tapering to the base; middle ones short-petioled and abrupt at the base, lance-oblong and ovate-oblong, gradually tapering to a long-acuminate apex, rough at the edge: spike cylindrical: stem thick, erect, sub-decumbent at the base. Flowers large, red, in a thick spike 2 to 3 inches long. In mud and moist ground."

P. coccineum, which had been accorded a very brief mention in the three previous editions, is next described more fully:

" . . . leaves long-petioled, oblong, abrupt and subcordate at the base, acute at the apex, glabrous and lucid; spike cylindrical; stem thick and strong, decumbent and rooting. Flowers red, in spikes not so long or so thick as the last. Stem creeps along the muddy banks of an island in the Hudson, above Troy, from 6 to 12 feet."

The former *P. natans* next appears as *P. fluitans*, with the description recast:

" . . . leaves long-petioled, oblong-oval, tapering to the base, obtuse and acute at the apex, glabrous and lucid: stem filiform, wiry, floating, sometimes rooting: spike cylindric. Flowers red, in spikes less than half as long as the last, and not a fourth as large as the preceding. Stem 10 to 15 feet long, often dark brown and sending off rootlets in clear water. Grows in Whiting's Pond, Columbia County, and in Botany Pond, three miles east of Albany. I have watched this and the two preceding species several years, and am satisfied, they are distinct. Finding this to be a new one, not var. *natans* of Mx. I give it a new name."

The three are further differentiated by the terms: "mud knotweed," "creeping knotweed," and "swimming knotweed." From footnotes we further learn that Eaton considered "*P. amphibium*" to be "var. terrestre T. (orr)"; his "P. coccineum" as "amphibium, Var. natans Mx." and the rechristened "*P. fluitans*" as "amphibium, Var. natans, 3d. ed. Manual and Var. aquaticum T." The remainder of Eaton's works, including the 8th edition (the "North American Botany," of Eaton and Wright) present the same views. Eaton's "*P. amphibium*" is evidently a vigorous example of the variable *P. coccineum.* To one who has devoted any considerable time to this group of plants, it will not appear remarkable that Eaton became somewhat confused about them; the wonder, if any, is that he made no more species. The fact remains that, in the third edition of his Manual, in 1822, he published a binomial to which the North American

analogue of *P. amphibium* L. can be referred. "*P. fluitans,*" later taken up by Greene as one of his numerous "species" cannot be held a valid designation.

Among other early American writers Torrey[1] listed *P. amphibium* α *terrestre* (*P. amphibium* β. *emersum* Michx. as syn.) and β. *aquaticum* (*P. amphibium* α *natans* Michx. and *P. natans* Eaton as syns.). As to the α *terrestre,* he states:

"The *P. amphibium* of this country is considered as a distinct species from the European plant by *Willdenow* and some other authors, but I am unable to discover any essential difference between them, except in the latter the leaves (of the var α) are scabrous."

As to the β. *aquaticum:*

"This can hardly be considered a distinct species, as it is sometimes found passing into the variety α. The European plant appears identical with ours."

Bigelow[2] described what is evidently *P. coccineum* Muhl. as *P. amphibium:*

" . . . leaves oblong-lanceolate, acute, rough at the edge; spike cylindrical . . . .
Distinct from the following species [*Polygonum coccineum* Willd.] by its leaves, which are generally lanceolate, though sometimes rounded at the base, the edges ciliate-serrulate, so as to feel rough, the veins having also sometimes the same character . . . .
It agrees perfectly with European specimens."

Under *P. coccineum* Willd. (*P. amphibium* α *natans* Michx. as syn.) he writes:

" . . . a more perfectly aquatic species than the last, better distinguished from it by the entire smoothness of its leaves than by the characters usually given . . ."

The treatment in Bigelow's third edition (1840) is a repetition.

Gray, in the first edition of his Manual (1848) reduced "P. coccineum *Bigel.*" and "P. fluitans *Eaton*" to "**P. amphibium** L. var. 1 AQUATICUM L." and described as "Var. 2. TERRESTRE *Torr.*" a form "More or less hairy or bristly, with an upright or ascending stem . . . the leaves acute or pointed, upper very short-petioled . . . " The range given is "New England to Wis., the var. 1 chiefly northward." "Very variable in foliage, &c.: spike 1′–3′ long, rose red." The description was considerably recast in the

[1] Torr. Fl. No. and Mid. U. S. i. 403 (1824).
[2] Bigelow, Fl. Bost. ed. 2: 157 (1824).

fifth edition (1867) with the note that "Var. TERRESTRE Willd., grows in shallow water, or in wet soil, or even 'in sandy prairies' in Illinois (*Dr. Mead*) either almost glabrous or strigose-hirsute, . . "

Among the early European treatments which mention the American plants Sprengel[1] introduced *P. coccineum* Muhl. into his edition of the Species Plantarum. Meisner[2] listed the aquatic form as *P. amphibium* α *natans* and the other as β *terrestre*, citing in addition to Muhlenberg (in Willdenow) and Pursh the Species Plantarum of Willdenow (1799) (which referred only to the European plant), showing that Meisner then regarded the forms of the two continents as identical. In his later and more extensive work[3] Meisner does not refer to "γ *terrestre*" in America, but proposes as "ε *Muhlenbergii*" the *P. coccineum* Muhl. which he now regards as distinctly American. It is not necessary in the present connection to discuss later European literature.

(*To be continued.*)

NOTES ON SAGINA

M. L. Fernald

In ordering the material of *Sagina* in the Gray Herbarium it has been found desirable to distinguish two forms which are not ordinarily recognized in America. These may be very briefly noted as follows.

Sagina **micrantha** (Bunge), n. comb. *Spergula micrantha* Bunge in Ledeb. Fl. Alt. ii. 183 (1830). *Sagina Linnaei*, α *micrantha* (Bunge) Fenzl in Ledeb. Fl. Ross. i. 339 (1841). *Sp. semidecandra* Turcz, ex Ledeb. l. c. (1841).

This Asiatic species occurs also on the Aleutian and adjacent islands and the islands of Bering Sea. The following are referred here. Alaska: St. Paul Island, *J. M. Macoun*, nos. 39, 89,644; Attu Island, *J. M. Macoun*, no. 38; Unga Island, *M. W. Harrington*.

S. saginoides (L.) Dalla Torre. The typical plant of the Arctic and of Eurasia has the sepals 2–3 mm. long, the capsules 3.4 mm. long. This extreme occurs southward rather locally to Gaspé Co., Quebec, and in western America to New Mexico and California, but most material of western North America stands apart in having the sepals only 1.3–2 mm. long. This American extreme may be called

[1] Spreng. Syst. ii. 239 (1825).
[2] Meisn. Mon. Gen. Polyg. Prodr. 67 (1826).
[3] Meisn. in DC. Prodr. xiv. 115 (1856).

S. saginoides, var. **hesperia**, n. var., sepalis 1.3–2 mm. longis.—The following belong here. Alberta: Malique Lake, *S. Brown*, no. 1176; Mt. Temple, Laggan, *Butters & Holway*. Montana: near melting snow, head of Cottonwood Creek, Tobacco Root Range, alt. 9000 ft., *Blankinship*. Colorado: Chambers Lake, alt. 9500 ft., *Crandall*, no. 89 (type in Gray Herb.). Idaho: near Lolo Divide, *Watson*, no. 58; near Sohons Pass, alt. 1500 m., *Leiberg*, no. 1425. Utah: Dyer Mine, Uintah Mts., *Goodding*, no. 1346. Nevada: head of Fall Creek, Ormsby Co., alt. 2460 m., *Baker*, no. 1332. California: Bear Valley, *Parish*, no. 1491; border of cold spring above Bluff Lake, alt. 8000 ft., San Bernardino Mts., *Parish*, no. 3605; Webber Lake, *Lemmon*; Cloud's Rest, Mariposa Co., *Congdon*. Oregon: Eagle Creek Mts., *Cusick*; along rills at 7000 ft., Powder River Mts., *Piper*, no. 2520. Washington: Mt. Rainier, *Allen*, no. 51; Cascade Mts., lat. 49°, *Lyall*. British Columbia: summit of Rocky Mts., alt. 8000 ft., *J. Macoun*, no. 10; Asulkan Valley, alt. 4100–6000 ft., *S. Brown*, no. 581; Fish Creek Valley, alt. 5000 ft., *Butters & Holway*.

Gray Herbarium.

Inconstancy in Color-forms of Hepatica americana.—In the spring of 1918 I took from the woods and set out in my door-yard four clumps of *Hepatica americana* (*H. triloba* of the Manual; see Rhodora xix. 45, March, 1917). Two bore the blue flowers typical of the species, one had them pink (*f. rhodantha* Fernald), and one white (*f. candida* Fernald). All have flourished; one clump yielded 84 blossoms at a single flowering and has never produced less than about 50. All are still thriving. But of the four only one, the white, has kept the color of its flowers wholly unchanged.

The pink form held its color for one season. Then for four years it came white. Last year (1924) it turned pink again and this year it is still pink, though rather pale. One of the blue-flowered clumps has preserved its color, with some little change of shade, until this spring, when it has suddenly and without transitional stages in previous seasons turned a clear lilac-pink. The flowers of the remaining clump are still blue, though this year very pale.

Dr. A. J. Eames has recorded instances of similar inconstancy in *Viola pedata*, f. *rosea* and in a color-form of *Rudbeckia hirta*. In these cases, however, the variation was in a different direction; his pink-flowered violets reverted to the typical blue and the corresponding reversion occurred in the *Rudbeckia*.

The causes of such inconstancy offer an interesting field for conjecture, or experiment by those equipped to make it. Evidently there is a difference in individuals. My pink-flowered plant was most subject to variation; the white-flowered one not at all. That the pure albino would be constant might, perhaps, be expected. At least, its sepals, tested with hydrochloric acid and ammonia, give absolutely negative reactions; and this, as far as it goes, would seem to indicate the absence in them of any pigment to change. And having, presumably, lost the power to produce pigment, this plant, at least, shows, to date, no tendency to recover it. In the other plants, the altered conditions after transplanting might stimulate physiological change. Moreover, once or twice a year the plants have been given a mulch of leaf-mold. Variations in the quantity of this, or in the degree of its decomposition might conceivably alter the chemical character of the soil sufficiently to induce, in individual plants of inherent physiological instability, changes in the cell-sap great enough to affect the sensitive anthocyan pigments concerned. Dr. Eames considered that weak or pathological conditions were responsible for the color-forms under his observation. If this be the case, variations in the leaf-mold might bring about variations in nutrition which would account for the changes in flower-color here recorded. But my vigorous plants are certainly not obviously weak or pathological; a much feebler appearing plant in another part of the premises has not changed color for five or six years. And horticulturists have been successful in fixing similar color-forms in flowers having anthocyan pigmentation.

In any case, the fact of inconstancy seems worth recording. It is in strong contrast to the behavior of a yellow-flowered *Trillium erectum*, also in my door-yard. Here, where a different kind of pigment is concerned, the flowers have come absolutely true to color for seven and three years respectively. So have some half-dozen plants of the typical form and one intermediate in coloration.—C. A. Weatherby, Gray Herbarium.

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OXALIS CORNICULATA AND ITS RELATIVES IN NORTH AMERICA.

K. M. Wiegand.

(*Continued from page 124.*)

6. O. florida Salisb. Prod. Strip. All. 322 (1796). *O. Dillenii β florida* DC. Prodr. i. 692 (1824). *O. glauca* Raf. in DC. l. c. *O. filipes* Robins. & Fernald in Gray's Man. ed. 7, not Small. *O. Brittoniae* Small in Britton's Man. 577 (1901). *Xanthoxalis Brittoniae* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora. *X. colorea* Small., Fl. S. e. U. S. 668 (1903), *O. colorea* Fedde in Just's Bot. Jahresb., xxxii. Pt. 1, 410 (1905).—Stems erect, rarely decumbent at base, brownish when dry; leaves scattered on slender loosely hairy petioles; stipules nearly obsolete; leaflets 5–18 mm. broad, glabrous above, slightly hairy beneath, green or sometimes purple, glaucous; peduncles exceeding the leaves; pedicels 5–25 mm. long, slender, substrigose; flowers 7–11 mm. long, heterogamous (?); corolla glabrous; filaments smooth or hairy; capsule short-cylindrical, gradually tapering toward apex; styles long and slender (3–4 mm. long), sometimes short (2 mm. long); seeds 1.0–1.2 mm. long, poorly developed.—Chiefly in dry fields of light or stony soil; Maine to central New York and Florida, mainly toward the coast but apparently not on the Coastal Plain. Some specimens examined: Maine: Falmouth, *E. B. Chamberlain & J. F. Collins*, no. 597; North Belgrade, *M. L. Fernald*. New Hampshire: Merrimack county, 1916, *H. L. Clark*. Vermont: Brookline, 1917, *L. A. Wheeler*. Massachusetts: Attleboro, 1916, *F. F. Forbes;* Northampton and Sheffield, *M. L. Fernald;* six other specimens all from western Massachusetts. Rhode Island: Cumberland, 1904, *B. L. Robinson*, *E. F. Williams*. Connecticut: West Hartford, 1904, *C. H. Bissell;* Salisbury, and Lakeville, 1902, *Fernald*, also others; Southbury, *C. A. Weatherby*, no. 1739; Fairfield, *E. H. Eames*, no. 8340; Oxford, 1903 and 1904, *E. B. Harger;* West Cheshire, *A. E. Blewitt*, no. 853. New York: northern N. Y., *A. Gray* (?); central N. Y., *A. J. Eames & L. H. MacDaniels*, no. 2736, 4478,

Wiegand & Eames, no. 10201, 12370, *A. J. Eames*, no. 10202, 10203, 13694, *K. M. Wiegand*, no. 12368, 12369, 14003, 14810, 14811; VanCortlandt, N. Y. City, and Riverdale, *E. P. Bicknell;* Bronx Park, *G. V. Nash.* Pennsylvania: Lancaster County, 1900, *A. A. Heller.* Virginia: Williamsburg, *E. J. Grimes*, no. 3849. North Carolina: Madison County, *J. R. Churchill;* Biltmore, *Biltmore Herb.* no. 5383a. Florida: Duval County, 1897, *J. R. Churchill.*

Var. **strigosifolia** var. nov. Foliis pagina superiori strigosis. Upper surface of the leaves strigose. New Hampshire, New York and Missouri. Specimens examined: New Hampshire: Walpole, 1903, *W. W. Eggleston;* North Walpole, 1903, *W. H. Blanchard.* New York: Spencer, *K. M. Wiegand*, no. 14811 (Type in Cornell Herb.). Missouri: Doniphan, *B. F. Bush*, no. 277. ? Arkansas: Camden, 1850, *A. Fendler.*

With some hesitation the name *O. florida* Salisb. has been adopted for this species. Salisbury cited "Oxy lutea americana humilior et annua. Dill. Hort. Elth. 298 t. 221 f. 288" on which *O. Dillenii* Jacq. was founded, and which is interpreted as *O. stricta.* In his description, however, he said, "stylis filamentis longioribus. . . . Herba nostrae stirpis saturate purpurea." which suggests *O. europaea* or the present species. De Candolle (Prodr.), who seems to have had some definite knowledge of the Salisbury plant, considered the name a synonym of *O. glauca* Raf. (then ined.), and both a variety of *O. stricta* (*O. Dillenii*). In the Gray Herbarium are two specimens of the present species that were compared by Professor Fernald with plants in the De Candollean herbarium. One bears a note by Fernald as follows: "This specimen except that it is more mature is quite the same as a specimen of 'Oxalis florida Sal. - Dillenii Jacq. *M. Salisbury* 1816' [The latter in handwriting of DC.] under *O. Dillenii*, β *florida* in Prodr. Herb." The other bears this inscription by Fernald: "This is exactly matched (1 & 2) by the specimen of '*Oxalis glauca Raf. n. sp. ? Philada.* Rafinesque, 1819' in Prodr. Herb. under *O. Dillenii* β *florida* [underscored portion of label Rafinesque's; the other DC's.]". It seems most likely therefore that Salisbury's plant belonged to the present species, as did also Rafinesque's.

7. O. europaea Jord. in Schultz, Arch. Fl. Franc. et Allem. 309 (1854). *O. ambigua* Salisb. Trans. Linn. Soc. ii. 242 (1794), not Jacq. Oxal. 80 (1794). *O. stricta* of most early authors, also Trelease in Gray's Synopt. Fl. i. 366 (1897). *O. corniculata* var. *stricta* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 88 (1888). *O. corniculata* Robinson & Fernald in Gray's Man. ed. 7. 534 (1908).—Stem 5–40 cm. high, simple or branched, usually erect, clothed with scattered ascending

hairs or glabrate; leaflets 33 mm. broad or smaller, generally thin, glabrous above, glabrate beneath; petioles 2–8 cm. long, slender, nearly or quite glabrous; peduncles generally exceeding the subtending leaves, slender, with a few strigose hairs; pedicels slender, strigose; calyx 3–5 mm. long, nearly or quite glabrous; flowers homogamous; corolla 5–10 mm. long, glabrous; filaments glabrous or hairy; capsule 8–12 mm. long, gradually acute; style short (2 mm. long), less commonly elongated (4 mm. long); seeds 1.2 (1.4) mm. long.—Quebec to North Dakota, southward to Georgia, Tennessee, Oklahoma, Colorado and Arizona; also introduced in Europe and probably in other countries. Apparently not common on the Atlantic Coastal Plain of North America.

Forma **pilosella** f. nov. Ab *O. europaea* typica recedit caulibus villosis. Similar to the typical form of *O europaea* in pubescence of leaves and pedicels but stem and generally the petioles and peduncles villous. Rhode Island, Missouri and probably elsewhere. Specimens examined: RHODE ISLAND: Middletown, *Margaret B. Simmons.* MISSOURI: Greenwood, *B. F. Bush*, no. 6701 (TYPE in Gray Herb.).

Forma **cymosa** (Small) comb. nov. *O. cymosa* Small, Bull. Torr. Bot. Club xxiii. 267 (1896). *O. rufa* Small, in Britton's Man. 577 (1901). *Xanthoxalis cymosa* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Stem nearly or quite glabrous; upper surface of leaflets glabrous; pedicels villous and more or less viscid. Quebec to Michigan, southward to North Carolina, Tennessee and Missouri. A common form in the northeastern United States, but apparently not common on the Atlantic Coastal Plain. The identification of *O. cymosa* Small with this form rests on Small's statement of stem subglabrate and pedicels villous.

Forma **villicaulis** f. nov. Formae *cymosae* similis sed caulibus villosis. Similar to forma *cymosa* but the stems villous. Chiefly in the interior: Nova Scotia and Massachusetts to Michigan, southward to Virginia, Tennessee, and Illinois. Many specimens were seen: type specimen (in Gray Herb.), Port Huron, Michigan, 1914, *C. K. Dodge*, no. 41.

Var. **Bushii** (Small) comb. nov. *O. Bushii* Small, Bull. Torr. Bot. Club xxv. 611 (1898). *Xanthoxalis Bushii* Small, Fl. S. e. U. S. 667 (1903). *X. interior* Small, Fl. S. e. U. S. 668 (1903). *O. interior* Fedde in Just's Bot. Jahresb. xxxii. pt. 1, 410 (1905).—Stem conspicuously villous; petioles and peduncles generally more or less villous; upper surface of the leaflets with scattered hairs; pedicels strigose, not viscid. Waverley, Massachusetts, and from western Ontario to Michigan, Illinois and Missouri. Specimens examined: MASSACHUSETTS: Waverley, 1895, *Robinson, Greenman & Schrenk.* ONTARIO: Lambton County, *C. K. Dodge*, no. 42. MICHIGAN: Port Huron, *Dodge*, no. 40. ILLINOIS: Urbana, 1901, *H. A. Gleason; Morgan* Park, *A. Chase*, no. 925. MISSOURI: many specimens, *Bush*, no. 30 (type collection), 315, 3283, 3297, 4032, 6754.

Forma **subglabrata** f. nov. Ab var. *Bushii* recedit caulibus substrigosis vel glabratis. Differing from var. *Bushii* in the glabrate or substrigose stems.—Illinois, Missouri and Iowa. Specimens examined: Illinois: Peoria, 1903, *F. E. McDonald*. Missouri: Courtney, *B. F. Bush*, no. 7678. Iowa: Ames, *Pammel & Ball*, no. 4 (Type in Gray Herb.).

Forma **vestita** f. nov. Var. *Bushii* similis sed caulibus villosis et pedicellis villosis viscidis. Similar to var. *Bushii* but stems and pedicels villous, the latter usually viscid. Massachusetts and Illinois. Specimens examined: Massachusetts: Cambridge, 1904, *Miss I. W. Anderson* (Type in Gray Herb.). Illinois: Riverdale, *O. E. Lansing Jr.*, no. 2625; La Salle County, *Greenman, Lansing & Dixon*, no. 144; Makanda, 1902, *H. A. Gleason*, no. 2449.

O. europaea is with little doubt a native of America, but was introduced into Europe about 1658. It seems to have been cultivated by Morison in 1660 and was figured by him in his Historia. An outline of the early history of this species in Europe is given by Ascherson and Graebner.[1] The European material all has appressed-pubescent pedicels (except one specimen from Germany), subglabrous stems, and glabrous upper leaf surfaces, and this form is therefore taken as the type of the species.

8. O. grandis Small, Bull. Torr. Bot. Club, xxi. 475 (1894). *O. recurva* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 89 (1888), not Ell. *Xanthoxalis grandis* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Plants tall and coarse, erect; stems very sparingly pubescent with scattered subappressed or spreading hairs; stipules nearly obsolete; petioles villous; leaflets glabrous above and with a few hairs beneath; peduncles scarcely exceeding the leaves, strigose or more commonly villous; inflorescence umbellate or sometimes cymose, 1–several-flowered; pedicels slender, strigose; corolla 12–18 mm. long, glabrous; filaments generally hairy; capsules short-oblong-ovoid, 7–10 mm. long; seeds (fide Small) 2 mm. long.—Pennsylvania to Illinois, southward to Georgia and Alabama (Small), but not along the coast. Specimens examined: Pennsylvania: Wysox, *Carey* (type collection ?). District of Columbia: 1897, *E. S. Steele*. Virginia: Smyth County, 1892, *J. K. Small*. North Carolina: Waynesville, *E. E. Magee;* Polk County, 1899, *J. R. Churchill;* Biltmore, *Biltmore Herb.*, no. 1225a; Swain County, 1891, *Beardslee & Kofoid*. Kentucky: Harlan County, 1893, *T. H. Kearney Jr.*, no. 11 and 280; Knoxville, *A. Ruth*, no. 282. Ohio: *Werner;* Cincinnati, *C. G. Lloyd*. Illinois: near Mt. Carnel, *J. Schneck*.

This species is related to *O. europaea* of which in appearance it seems to be a gigantic form, but the capsules are short even for that species

[1] Synop. Mitteleu. Fl. vii. 149 (1913).

and the seeds according to Small's description are larger and may have more interrupted ridges. Mature seeds have not been seen by the writer. In one specimen (Cincinnati, C. G. Lloyd) the leaves are strigose above and the plant is otherwise much more hairy than usual.

9. O. Suksdorfii Trelease, Mem. Bost. Soc. Nat. Hist. iv. 89 (1888), Small, Bull. Torr. Bot. Club xxiii. 456 (1896). *O. pumila* Nutt. in Torr. & Gray's Fl. N. A. i. 212 (1838), not d'Urv. (1826). *Xanthoxalis Suksdorfii* Small, N. A. Flora xxv. 53 (1907).—Stems 5–18 cm. high, generally erect from creeping woody stolons, rather slender, sparingly villous; stipules oblong or generally nearly obsolete; petioles filiform, villous; peduncles slender, appressed-villous; pedicels filiform, 6–20 mm. long, strigose; corolla 12–16 mm. long, glabrous; filaments generally hairy; capsule very short-oblong or ovoid-conic, little exceeding the calyx, tapering toward apex, crisp-puberulent. Banks and woods, yards and parks: Oregon (California, Small[1]).

The writer has not seen specimens of this species from California, but the plant may possibly occur in that part of the state bordering Oregon. *O. pumila* d'Urv.,[2] though regarded in the Index Kewensis, as a synonym of *O. enneaphylla* Cav. is not certainly so, and therefore, according to the International Rules, Nuttall's name should not be used.

10. O. recurva Ell. Sketch Bot. S. Car. and Ga. i. 526 (1821); Small, Bull. Torr. Bot. Club, xxi. 474 (1894); Britton & Brown's Ill. Fl. N. Sta. and Can. ed. 1. (1898); Britton, Manual N. Sta. & Can. 577 (1901); also in part, Trelease in Gray's Synopt Fl. i. 366 (1897), not Trelease in Mem. Bost. Soc. Nat. Hist. iv. 89 (1888). ? *O. Lyoni* Pursh, Fl. Am. Sept. i. 322 (1814). *Xanthoxalis recurva* Small, Fl. S. e. U. S. 668 (1903), and N. A. Flora.—Stems upright, 5–15 cm. high, from creeping rootstocks, villous with more or less spreading tawny hairs; petioles slender, villous; stipules small or obsolete; leaflets rather thin, glabrous above, sparingly hairy beneath; peduncles with subappressed pubescence; pedicels slender, 7–18 mm. long, strigose; corolla 13–18 mm. long, glabrous; filaments generally hairy; mature capsule not seen (slender according to Small).—Dry sandy more or less open soil: North Carolina to Georgia. Specimens examined: North Carolina: Columbus, 1900, *E. C. Townsend*, (Cornell Herb.). South Carolina: Coastal Plain near Ashley River, *B. L. Robinson*, no. 188. Georgia: Sylvania, *R. M. Harper*, no. 2082.

Trelease extended the range of this species to Pennsylvania and Texas, and Small attributed it to Missouri and Mississippi. The writer has not seen specimens from these states. According to Small

[1] Bull. Torr. Bot. Club xxiii. 456 (1896), and N. A. Flora.
[2] Mém. Soc. Linn. Paris iv. 616 (1826).

the above form agrees well with Elliott's type in the Charleston Museum.

Var. **texana** (Small) comb. nov. *Xanthoxalis texana* Small, Fl. S. e. U. S. 667 (1903), and N. A. Flora. *O. texana* Fedde in Just's Bot. Jahresb. xxxii. pt. i. 410 (1905). Similar to typical *O. recurva* in habit but the stems, petioles and pedicels appressed-pubescent; leaflets either glabrous or hairy on the upper surface. Texas: *Wright* (type collection?). Mexico: Monterey, *W. M. Canby*, no. 54.

Var. **macrantha** (Trelease) comb. nov. *O. corniculata*, var. ? *macrantha* Trelease, Mem. Bost. Soc. Nat. Hist. iv. 88 (1888). *O. macrantha* Small, Bull. Torr. Bot. Club xxiii. 268 (1896), not of Fl. S. e. U. S., nor of N. A. Flora. *O. recurva* in part, Trelease in Gray's Synopt. Fl. l. c. *O. hirsuticaulis* Small, Bull. Torr. Bot. Club, xxv. 611 (1898). *Xanthoxalis hirsuticaulis* Small, Fl. S. e. U. S. 669 (1903), and N. A. Flora. *O. Priceae* Small, Bull. Torr. Club, xxv. 612 (1898). *Xanthoxalis Priceae* Small, Fl. S. e. U. S. 669 (1903).—Stems and petioles shaggy with spreading pubescence; peduncles pilose; corolla sparsely hairy outside or glabrate; filaments generally hairy; capsule cylindrical, about 15 mm. long; seeds 1.4 mm. long.—Kentucky, Tennessee, and Alabama. Specimens examined: Kentucky: Bowling Green, 1889 and 1900, *Sadie F. Price*. Alabama: *Hatch*.

Forma **sericea** f. nov. Ab var. *macrantha* recedit foliis utrinque strigosis. Leaflets rather strongly appressed hairy on both faces. Alabama: old specimen in Gray Herb. (Type.)

Var. **floridana** var. nov. *Xanthoxalis macrantha* Small Fl. S. e. U. S. 667 (1903), probably, and N. A. Flora, not *O. macrantha* Small, Bull. Torr. Bot. Club. xxiii. 268 (1896). *O. recurva*, in part, Trelease, in Gray's Synopt. Fl. i. 366 (1897).—Caulibus subadpresso-pubescentibus, foliis pagina superiori strigosis. Stems more diffuse than in the typical form, from less evident rootstocks and with more ascending pubescence; peduncles shorter; leaflets strigose on the upper surface; pedicels with appressed pubescence.—Florida. Specimens examined: Apalachicola, *Drummond*. East Florida, *Herb. D. C. Eaton* (Type in Gray Herb.).

The writer can find no good specific characters to separate *O. recurva* and its var. *floridana*, *O. texana*, *O. macrantha* and *O. Priceae* as is done by Small. The differences seem to be in degree and type of pubescence only, and even these differences vary greatly. With the exception of the var. *floridana* the plants all have a rather characteristic appearance, consisting of an erect stem arising from long horizontal rootstocks and surmounted by flowers rising considerably above the leaves.

The nomenclature in this group of large flowered eastern forms is difficult to decipher. The identity of *O. recurva* Ell. is now quite

certain, as Small has seen the type. Trelease's transfer of the name to what is now *O. grandis* was an error. The *O. corniculata,* var.? *macrantha* Trelease was incompletely understood, as the author himself indicated by the question mark. It probably included some specimens of the western *O. Wrightii,* var. *pilosa* as well as the eastern type. The variety was described as having the branches i. e. the upright stems?) pilose. Specimens in the Gray Herbarium marked var. *macrantha* by Trelease have hirsute or pilose stems. Small based his species *O. macrantha* on the var. *macrantha* of Trelease and described the stems as "hirsute" and petioles "pubescent like the stem." Later however he described *O. hirsuticaulis* as having "densely hirsute" stems, and the petioles "villous-hirsute," at the same time transferring the name *O. macrantha*[1] to a plant with "strigillose" stems and "strigillose" pedicels. *O. macrantha* rather than *O. hirsuticaulis* is therefore the proper name for the hirsute form of *O. recurva.* The original description of *O. Priceae* Small also agrees with our var. *macrantha,* as do two specimens of *O. Priceae* in the Gray Herbarium collected by Miss Price. Small states[2] that a pubescent corolla has been found by him only in *O. Priceae* among the yellow flowered species of Oxalis. The specimens of var. *macrantha* cited above all have some hairs on the corolla.

CORNELL UNIVERSITY, Ithaca, N. Y.

A WHITE FORM OF DELPHINIUM AJACIS.

R. H. CHENEY.

DURING the summer of 1924, while collecting representative types of New England flowering plants for the Washington Square College Herbarium at New York University, I found two localities where a *pure* white growth of *Delphinium Ajacis* L. was abundant. Both areas were wet, waste ground. The first growth was noted in Forest Hills, Massachusetts, on July 24, 1924. The other station was in Raymond, New Hampshire, on August 13, 1924.

The genus *Delphinium* includes only two unipistillate species in the United States; namely,—*D. Ajacis* L. (Rocket Larkspur), with pubescent follicles and *D. Consolida* L. (Field Larkspur), with glabrous

[1] Fl. S. e. U. S. 667 (1903).
[2] Bull. Torr. Bot. Club xxv. 613 (1898).

follicles. Several authorities, including Dr. Small,[1] mention a white-flowered *D. Consolida* L. but only one authoritative flora[2] of the United States records *D. Ajacis* L., to which these specimens undoubtedly belong, as having white flowers. Britton and Brown's record is "rarely white."

Mr. Bayard Long[3] clarified the confusion existing in American floras between *D. Ajacis* L. and *D. Consolida* L. The common Rocket Larkspur, which has been an escape from cultivation in this country at least since 1814, has been described in all early floras as having smooth follicles. Pursh's Flora (1814); Nuttall's Genera (1818); Eaton's Manual Bot. ed. 5 (1829); Torrey & Gray in 1838; and Gray's Man. Bot. ed. 1 (1848), all described the common Larkspur escape as *D. Consolida* L. Darby[4] recorded the plant, *Delphinium Consolida* L., as having smooth *or* pubescent follicles. Gray (Watson & Coulter ed.) Man. Bot. (1890) was the first record in American floras to distinguish the pubescent-follicled plant as *D. Ajacis* L. in agreement with the European species description. *D. Consolida* L., however, remained in the floras as a common species although only five American herbarium sheets substantiate its existence. Dr. Britton states clearly in Britton & Brown Illust. Fl. (1914) that all specimens examined at that time proved to be *D. Ajacis* L. My examination of the same and additional material at the N. Y. Botanical Garden, verified the statement and also showed that no *pure* white specimens were present.

This unipistillate, pubescent species is normally a blue-flowered plant although the flowers are commonly faded to a very considerable degree, especially the older flowers of the raceme, and frequently only a trace of color persists. Such a trace, however, was found to be present in all cases with the exception of one Virginian specimen which appeared to have been distinctly white. A brief statement concerning the essentially white-flowered specimens in the N. Y. Botanical Garden Herbarium follows:—

One European specimen—nearly white; collected in 1868.

Another European specimen—bluish tinge; collected in 1839 by Rev. J. G. Leefe.

Roanoke, Virginia specimen—bluish and pink tinge on the same plant. Collected in 1890.

[1] Small Fl. So. East. U. S. (1903) 433.

[2] Britton & Brown Illust. Fl. No. U. S., Canada, etc. ed. 2, 2 (1913) 94.

[3] Long *Delphinium Consolida* L. in Amer., etc., in Rhodora No. 212, 18 (1916) 169–177.

[4] Darby Bot. of the So. States (1859) 207.

Beleu, El Paso Co., Texas—One small specimen with only two flowers. These were whitish. Collected in June 1893 by Dr. E. A. Mearns.
Independence, Missouri specimen—pinkish-white; collected in June 1895 by B. F. Bush.
Sand Hills, Augusta, Georgia—Spur bluish; collected by A. Cuthbert. No date given.
Blacksburg, Virginia specimen—In full flower and distinctly white; collected in June 1895 by Dr. W. A. Murrill. This specimen is undoubtedly *D. Ajacis* L., and I believe it represents another locality for the form which is given here as new.
Winfield, Kansas specimen—bluish tinge; collected in April 1898 by Mark White.
Pictou, Nova Scotia specimen—Slight pink tinge on spur; collected in August, 1906 by C. B. Robinson.
Cumberland River region, Western Kentucky specimen—pinkish-white; collected in June 1909 by W. W. Eggleston.

Several other American records in respect to essentially white Delphiniums occur in the literature but they prove to be either copied statements from earlier works or to be horticultural hybrids. Bailey[1] describes the *D. Ajacis* L. perianth as 'varying to white.' Davis[2] also records the flower color by the same wording. The Amer. Comm. Hort. Nomen. on Standard Plant Names (1923) 123, mentions a so-called 'White Siberian Delphinium.' This is, however, a hybrid or at least a horticultural form of *D. grandiflorum,* not *D. Ajacis* L. The Gray Herbarium and the Herbarium of the New England Botanical Club have no *pure* white specimens of *D. Ajacis* L.

A study of European floras for their descriptions of *D. Ajacis* L. reveals the same generalization regarding the perianth color as 'whitish, rarely white' etc., as is found in our American floras. In many instances, I suspect, the statement is merely a copy from earlier works. Coste, Flore de la France 1 (1901) 49, records the flowers of *D. Ajacis* L., as blue, pink or white. Gillet & Magne, Nouv. Flore Française (1883) 17, mention the perianth as colored; Grenier & Godron, Flore de France 1(1848) 47, as blue, white or pink; Rouy & Foucaud, Flore de France 1 (1893) 131, as blue, pink or white; Thomé's Flora von Deutschland 2 (1886) 122 as blue, white or red; Bentham, Brit. Flora ed. 4 (1878) 15, as blue, white or reddish; Sowerby, Engl. Bot. 1 (1899) 62, as bright French blue, more rarely white or pink, paler on the outer side; Hegi, Illustrierte Flora von Mittel-Europa 3 (1909–13) 488, as blue-violet, rarely pink or white. Examination of the European specimens, however, in the herbaria of the N. Y. Botanical Garden, of the Brooklyn Botanic Garden, and of the Gray Herbarium showed no *pure* white specimens.

[1] Bailey Cycl. Hort. 2 (1914) 976.
[2] Davis, K. C. Taxon. Study of No. Amer. Ranunc. (1900) 435.

As a pure white growth of *D. Ajacis* L. was found in two states in New England during the summer of 1924, and since all available herbarium records, with the possible exception noted above, show traces, at least, of color, these specimens seem to represent a true form which is as well established locally in New England as the species itself. Both are escapes. I have named the form,—Delphinium Ajacis L. forma **alba**, forma nova.

Washington Square College, New York University,
New York City.

BIDENS EATONI AND ITS VARIETIES.

Norman C. Fassett.

It frequently happens that, on the mouths of rivers, the influence of the tide extends farther up the river than does the salt water. The plants growing on these river shores will, therefore, alternately be submerged by fresh water and exposed to the sun. The part of the river where this phenomenon occurs is called the estuary. *Bidens Eatoni* was described in 1903 from the estuary of the Merrimac River, and has been shown by subsequent investigation to be a strictly estuarine species, on the mouths of several rivers from the Hudson to the Kennebec. It is remarkable that on each estuary where this species appears it occurs in a slightly different phase, that is, it shows a great development of endemic varieties.

Bidens Eatoni is most closely related to *B. bidentoides, B. connata,* and *B. heterodoxa,* all of which are characterized by having striate achenes which are, at least at the base, upwardly barbed along the margins, and simple leaves which are often deeply 3-cleft. From the two latter species *B. Eatoni* and *B. bidentoides* differ in having less than 30, usually 8–25, flowers to each cylindric to campanulate head, as opposed to 30–60 flowers in the heads of *B. connata* and *B. heterodoxa.* *B. bidentoides,* which has copiously pubescent achenes, plano-convex in cross-section, without conspicuous midribs, and with very slender awns (at least ½ as long as the body of the achene), is at once distinguished from *B. Eatoni,* with its sparingly pubescent, flat to bi-convex achenes, with conspicuous midribs and stout awns.

Bidens Eatoni breaks up into varieties as follows:

a. Inner achenes 6.8–9 mm. long: awns 2, rarely 4 *b*
b. Heads narrowly cylindric, at least when young *c*
c. Awns retrorsely barbed . . . . var. *typica.*
c. Awns antrorsely barbed . . . . var. *fallax.*
b. Heads broadly cylindric to campanulate *d*
d. Inner bracts of the involucre striated with dull yellow to dark brown: lower leaves often 3-parted *e*
e. Awns 1.5–4 mm. long, retrorsely barbed . . . . var. *interstes.*
e. Awns 0.5–2 mm. long, barbed both retrorsely and antrorsely . . . . var. *mutabilis.*
d. Inner bracts of the involucre striated with lustrous amber to purple brown, lustrous black in age: leaves all simple . . . . var. *simulans.*
a. Inner achenes 9–11 mm. long: awns 4, rarely 2 *f*
f. Heads usually cylindric: leaves with petioles 1–3 cm. long, the lower usually divided . . . . var. *kennebecensis.*
f. Heads subcylindric to campanulate: leaves subsessile or with short broad-winged petioles, not divided . . . . var. *major.*

B. Eatoni, var. **typica.** *B. Eatoni* Fernald, Rhodora v. 92. fig. 11–13 (1903). Massachusetts: estuary of the Merrimac River, at Newburyport, West Newbury, Salisbury, and Amesbury.

B. Eatoni, var. fallax Fernald, l. c. fig. 14. Occasional with the typical form.

B. Eatoni, var. **interstes** (Fassett), n. comb. *B. heterodoxa* (Fernald) Fernald & St. John, var. *interstes* Fassett, Rhodora xxvi. 178 (1924). Plants 1–8 dm. tall: leaves lanceolate to narrowly ovate, serrate, 0.5–1.5 dm. long, narrowed to a winged petiole, the lower often deeply cleft or 3-parted: heads campanulate, the terminal 8–10 mm. high, 8–12 mm. broad; outer bracts of the involucre 2–5, usually 3, lanceolate, acute, sometimes minutely toothed toward the apex; inner bracts striated with dull yellow to dark brown: achenes flat or with slightly keeled midribs, the outer 5.5–6.5 mm. long, the inner 6.5–8 mm. long, on the margins downwardly barbed except at the base where one or more barbs stick upward; awns 2, rarely 4, retrorsely barbed, 1.5–4 mm. long, the inner pair if present shorter.—Maine: tidal shores at the mouth of Eastern River, Dresden, September 13, 1924, *N. C. Fassett*, no. 2122; tidal shores of the Kennebec River, Hatch's Corners, Dresden, September 9, 1924, *N. C. Fassett*, no. 2101; South Gardiner, September 16, 1924, *N. C. Fassett*, no. 2127; tidal shores of the Kennebec River, near the Maine Central R. R. ferry, Woolwich, September 18, 1924, *N. C. Fassett*, no. 2125; rocky places, tidal shores of the Kennebec River, Gardiner, September 18, 1923, *N. C. Fassett*, no. 852 (type in Gray Herb.); tidal shores, Sheepscot River, Alna, September 12, 1924, *N. C. Fassett*, no. 2120.

The small number of flowers in the heads of this plant shows it to belong not with *B. heterodoxa*, but with *B. Eatoni*. The achenes are similar to those of var. *typica*, but a little broader in proportion to their length, while the heads are campanulate instead of cylindric.

B. Eatoni, var. **mutabilis**, n. var., var. *interstitem* habitu foliisque

simulans; achaeniis exterioribus 5.5–6 mm. longis, interioribus 7–7.5 mm. longis; aristis 2, 0.5–2 mm. longis, retrorse antrorseque setosis.

Resembling var. *interstes* in habit and foliage: outer achenes 5.5–6 mm. long, inner 7–7.5 mm. long; awns 2, 0.5–2 mm. long, with barbs both retrorse and antrorse on the same awn, as well as along the margins of the achenes.—Estuary of the Kennebec River.—MAINE: tidal shores of the Kennebec River, Cedar Grove, Dresden, September 9, 1924, *N. C. Fassett*, no. 2116 (TYPE in Gray Herb.); tidal shores of the Kennebec River, Dresden, September 16, 1924, *N. C. Fassett*, no. 2123.

B. EATONI, var. **simulans**, n. var., var. *interstitem* habitu achaeniisque simulans; foliis lanceolatis simplicibus; striis bractearum interiorum nitentibus sucino vel purpureo-fusco, aevo nigrescentibus nitentibus.

Resembling var. *interstes* in habit and fruit: leaves lanceolate, not divided: inner involucral bracts striate with lustrous amber to purple-brown, which turns lustrous black in age.—Estuary of the Connecticut River.—CONNECTICUT: hidden among tall grasses and sedges in brackish marsh, Old Lyme, September 9, 1917, *R. W. Woodward;* brackish marsh, Old Lyme, October 1, 1915, *R. W. Woodward* (TYPE in Gray Herb.); brackish marsh, Old Lyme, September 29, 1915, *R. W. Woodward;* sandy shore just above high water, Old Lyme, September 29, 1917, *R. W. Woodward;* tidal shores of the Connecticut River, Essex, October 13, 1924, *N. C. Fassett*, no. 2298; tidal shores of the Connecticut River, East Haddam, October 12, 1924, *N. C. Fassett*, no. 2299.

B. EATONI, var. KENNEBECENSIS Fernald, RHODORA xix. 76 (1917). Estuarine system at the mouth of the Kennebec River, Maine. In it long achenes and narrowly cylindrical heads this variety is quite distinct from var. *interstes* and var. *mutabilis* of the same region.

B. EATONI, var. **major**, n. var., planta 4–15 dm. alta, caulibus saepe prostratis nudisque infra; foliis lanceolatis 0.5–1.5 dm. longis simplicibus grosse serratis, petiolis brevibus alatis vel foliis angustatis ad basem subsessilem; capitulis subcylindratis vel campanulatis, terminalibus 1.3 cm. altis 18–30(–33)-floribus; bracteis exterioribus fere 3 linearibus acutis 1–2 cm. longis 2–3 mm. latis; achaeniis exterioribus 6–7.5 mm. longis aristis 3–4; achaeniis interioribus (8–)9–11 mm. longis costis saepe crassis ad apicem, aristis fere 4 retrorse setosis.

Plants 4–15 dm. tall, stems often reclining and naked below: leaves lanceolate, 0.5–1.5 dm. long, coarsely serrate but not divided, with short winged petioles, or narrowed to a sessile base: heads subcylindric to campanulate, the terminal 1.3 dm. high, 18–30(–33)-flowered: outer involucral bracts usually 3, 1–2 cm. long, 2–3 mm. broad, linear, acute: outer achenes 6–7.5 mm. long, awns 3–4 in number; inner achenes (8–)9–11 mm. long with midribs often somewhat thickened at the summit, awns usually 4, retrorsely barbed.—CONNECTICUT: tidal shores of the Quinnipiac River, North Haven,

October 14, 1924, *N. C. Fassett*, no. 2301 (TYPE in Gray Herb.); tidal shores of the Quinnipiac River, North Haven, *N. C. Fassett*, no. 2302 (has 33 flowers in the largest heads, and somewhat resembles *B. laevis*). NEW YORK: shores of the Hudson River, near the upper limit of tide, Hudson, September 30, 1923, *H. K. Svenson*.

This plant as it grows on the estuary of the Quinnipiac River has prostrate bases which strongly suggest those of *B. laevis*. The Hudson River specimen lacks this characteristic, but is otherwise essentially like the Connecticut material. A single plant collected in Massachusetts, on tidal shores of the Merrimac River, Amesbury, October 16, 1924, *N. C. Fassett*, no. 2300, may belong with this variety, but may be var. *kennebecensis*. It was collected late in the season and is in such poor condition that it is difficult to determine its affinities.

The estuary of the Taunton River, in southeastern Massachusetts, extends from Wier Village to the northern part of the town of Berkeley, and up the Three Mile River to North Dighton. On these shores grow *Bidens connata*, *B. comosa*, *B. cernua*, and a fourth *Bidens* which seems most closely allied to *B. Eatoni*. It is much branched, with many small leaves and short cylindric heads. The achenes are somewhat flattened as in *B. Eatoni*, or angled and with keeled midribs as in *B. connata*, or trigonous. With the collections now available it is impossible to determine its exact status, but it seems at present best treated as a hybrid of *B. Eatoni* and *B. connata*. Botanists should keep this region in mind; collections made in late summer would probably throw more light on the affinities of this plant.

BIDENS **multiceps**, n. hyb. = *B. connata* × *Eatoni* (?), planta 2–6 dm. alta ramosissima super basem simplicem; foliis lanceolatis simplicibus 2–4 cm. longis integris vel cum dentibus utrinque 1–2 instructis; petiolis brevibus; capitulis multis late cylindratis, terminalibus 4–7 mm. altis 15–18-floris; bracteis exterioribus 1–1.5 cm. longis integris latioribus ad apicem obtusum; achaeniis exterioribus 4–7 mm. longis, planis, 2–4 aristis retrorso-barbatis; achaeniis interioribus 7–8 mm. longis, planis vel trigonis vel saepe in costis alatis, aristis 2–4 retrorso-barbatis.

Plants 2–6 dm. tall, much branched above the simple base: leaves lanceolate, short-petioled, 2–4 cm. long, entire or with 1–2 pairs of teeth: heads numerous, broadly cylindric, the terminal 4–7 mm. tall, 15–18-flowered; outer involucral bracts 1–1.5 cm. long, entire, broader toward the obtuse apex: outer achenes 4–7 mm. long, flat, with 2–4 retrorsely barbed awns; inner achenes 7–8 mm. long, flat, trigonous, or often with keeled midribs, awns 2–4, retrorsely barbed.—Estuary

of the Taunton River.—Massachusetts: tidal shores of the Taunton River, Dighton, October 21, 1923, *Johnston & Fassett*, no. 905; tidal shores of the Taunton River, Berkeley, October 21, 1923, *Johnston & Fassett*, no. 903; tidal shores of the Three Mile River, Dighton, October 21, 1923, *Johnston & Fassett*, no. 906 (type in Gray Herb.).

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THE AMPHIBIOUS GROUP OF POLYGONUM, SUBGENUS PERSICARIA.

E. E. Stanford.

(Continued from p. 129.)

As the next advance in the study of these plants Gray[1] proposed *Polygonum Hartwrightii*, differentiating it chiefly by the spreading foliaceous rim of the ocrea, with the comments:

"Fruit unknown. I collected this almost 40 years ago at the head of Cayuga Lake [N. Y.] along with the remarkable *P. amphibium* var. *Muhlenbergii* of Meisner, which is widely distributed in North America. I saw it several years ago . . . in a high bog near the southern borders of Herkimer County, but not in flower. I have also a well developed specimen from the State collection in Michigan. Not regarding the stipules, it had been taken for one of the various puzzling varieties of *P. amphibium*, or, where the stipules were noticed, for an undeveloped condition of *P. Careyi*. But my attention having been called to it by Dr. S. Hart Wright, of Penn Yan, who finds it in open bottom land, among Carices, at Dundee, Yates County, New York, I am desirous that it should bear his name, as the real discoverer of its specific characters."

Watson[2] took up the varietal name of Meisner for *P. coccineum*, and published *P. Muhlenbergii:*

"New England to Texas and westward to Washington Territory and northern California . . . . . including most of the var. *terrestre* of American botanists. Our subterrestrial form of *P. amphibium* seems rarely if ever to correspond to the var. *terrestre* of Europe."

The same writer, in including *P. Hartwrightii* in his Botany of California, remarked that it "Varies greatly . . . approaching *P. amphibium* too closely."

Britton[3] revived for the same plant the varietal designation of

[1] Gray, Proc. Am. Acad. viii. 294 (1870).
[2] Watson, Proc. Am. Acad. xiv. 295 (1879).
[3] Britton, Trans. N. Y. Acad. Sci. viii. 73 (1889).

Michaux, as *P. emersum* (Michx.) Britton, and this name has been used by several later writers. In the sixth edition of Gray's Manual the aquatic plant corresponding to *P. natans* (Michx.) Eaton is listed as *P. amphibium* L., *P. coccineum* as *P. Muhlenbergii* Wats., and *P. Hartwrightii* is also included as a species. These three general groupings have been followed in most later American floristic works. A few years later Sheldon[1] described from Minnesota *P. rigidulum*, a plant treated in this paper as a variety of *P. coccineum*.

Further subdivision in the amphibious group is chiefly the work of Greene.[2] This writer was one of the first, and the principal modern American botanist, to advocate the elevation to generic rank of the various subordinate groupings proposed by Meisner and others, and he published the proposed species of these plants under the generic designation *Persicaria*, which seems to have been very generally used in pre-Linnean time. Greene was also most emphatic in his opinion that the European *Polygonum amphibium* L. was distinct from any American species (though characteristically not considering it necessary to record any detailed statement of the differences). His general opinions as to the amphibious group are expressed in the following excerpt:

"The view reached by myself after years of observation upon living plants both at the West and at the East is that we have a number of distinct species that are normally aquatic, and as many more that are normally terrestrial; and that our aquatic plants, at least in several instances, appear as riparian plants with wonderfully changed foliage, and that several of our normally terrestrial species do, under certain conditions, develop aquatic branches with floating foliage, this also strangely altered from the terrestrial type, yet at the same time most unlike that of the truly aquatic species in general.

I also suspect that some of the aquatic, or at all events some riparian species exist in even a third state, more strictly terrestrial, with a third set of strongly marked peculiarities of habit and foliage, and that in such third form the plants flower either very rarely or never at all."

Greene's observations thus correspond to a certain extent with those of European authors elsewhere cited, who recognize three principal adaptations of *P. amphibium*, usually referred to as the varieties *natans* Moench, *terrestre* Leers, and *maritimum* Dethard., according to occurrence in water, as emersed or terrestrial, or in an arid habitat

[1] Sheldon, Bull. Geol. Nat. Hist. Surv. Minn. ix. 14 (1894).

[2] Greene, *Certain Polygonaceous Genera.* Leaflets, i. 17–50 (1904).

such as a sand-dune. Greene also emphasized the idea that these adaptive modifications were "states or phases, not varieties, so that to give them any kind of separate rank, or to assign them names as such would be to misrepresent the facts in the case, and therefore to be unscientific." He remarked also that

"The delimitation of species will be most difficult, so long as a number of the species are known in only one of the three of their possible phases. Nevertheless, I am about to propose a very considerable number of new species: and shall found some upon the aquatic phase only, others upon a riparian state only, as well as many more upon properly terrestrial plants, In the case of these last I am the less afraid of erring, knowing as I think I do, that these are more commonly of one phase only. But in the case of the normally aquatic, I shall doubtless found aggregates . . . .

Here, then is work for many a future generation of botanists . . . it must be begun in the field, and carried on there, patiently and persistently."

It might be remarked that this is not the only case in which Greene's labors have provided "work for many a future generation of botanists." He also declined

"To make any use or application of old varietal names, such as *terrestris*, *emersa*, *Muhlenbergii*, *natans*, and others. No one knows, and perhaps no one will ever know, what the forms or states or phases were to which the authors applied the names; and to use them ignorantly of their first application is but to make confusion worse confounded."

The "very considerable number of species" amount to 44, to which another, *P. Andrewsii*, was later added. Four—*Persicaria fluitans* (Eaton) Greene, *P. coccinea* (Muhl.) Greene, *P. rigidula* (Sheldon) Greene, and *P. Hartwrightii* (Gray) Greene, had been described by previous writers. The rest are "new." The diagnoses, discussions, and citations of specimens cover some 24 pages; no keys are given. The following excerpt indicates the general method followed:

"A diligent study of much material from almost all parts of the United States, occurring in the herbaria under the name of *Polygonum Muhlenbergii*, more recently denominated *P. emersum*, has shown that this also is an aggregate of species, some of them strongly marked, others less so. They differ from one another markedly as to leaf outline and also as to the attitude of the foliage, the leaves in some spreading away from the stem almost divaricately, but in the greater number being ascending or suberect. As to the pubescence, they exhibit not only different degrees but different kinds of hairiness; and that of the midvein beneath invariably differs from that of the

superficies of the leaf. In both the form and the indument of the bracts of the spikes one finds also another set of specific characters."

Of the total number of species 4 were described as from Greene's own collection. The number of specimens cited does not in most cases exceed three.

All Greene's species were transferred to *Polygonum* by Fedde in 1905. This transfer is obviously to be taken as merely a matter of form, based on a different conception of the genus, rather than as an expression of judgment of the validity of the species proposed.

It may be in order to interpolate at this time the views of the present writer as to the validity of these "species." Type or duplicate type material of a considerable number is available at the Gray Herbarium, and a considerable study of this material, together with comparison of the characteristics of the different types with each other and with those believed to be valid as distinctions throughout the North American Persicarias, indicates that for the most part the specimens present habital and ecological variations which are extremely inconstant when traced through a considerable amount of material. As much variation may be observed between some of the duplicate types as between many of the separate "species." Some of them may be entitled to rank as varieties, and the interblending and inconstancy of differential characteristics renders the establishment of satisfactory lines of demarcation extremely difficult. If the hypothesis of interbreeding mentioned elsewhere should prove to have any validity, this interblending, accompanied as it is by a high degree of sterility, will be further explained. In the present state of our knowledge, the writer believes that the subject of the American amphibious Persicarias may best be handled without attempting a high degree of technical subdivision upon the rather elusive characters which exist. The present treatment recognizes under *Polygonum natans* a variety based upon *Persicaria insignis* Greene, an aquatic form characterized by unusually large flowers; and under *Polygonum coccineum* a variety based primarily on *Persicaria pratincola* Greene, emended. The latter variety as here understood includes the usually strigose-hairy types of the general region of the Mississippi Valley. In this area *Polygonum natans* appears to be absent, and the material referable to *P. coccineum* shows a somewhat greater constancy and tendency to increased fertility as compared with the types occurring where the ranges of the species coincide. Another variety of *P.*

coccineum, based on *P. rigidulum* Sheldon, is also recognized. It is quite possible that further field study, undertaken with the findings of the present paper in mind, may establish other varieties.

To complete at this time the account of the Greene influence in the study of this group of plants, mention must be made of the work of Nieuwland[1] which covers some 70 pages and is the most voluminous American treatment of the amphibious group. It includes a considerable review of the pre-Linnean literature, introduced, aside from its historical value, to indicate that Linnaeus and his predecessors knew that *Polygonum amphibium* was amphibious, and that the variations between plants of water and land habitat were on that account not deemed worthy by them of varietal rank. In general the paper is an amplification of the viewpoint of Greene:

"There is no logical alternative between accepting the Linnean view of one sole species of amphibious Smartweed on the one hand, and Dr. Greene's view of a number of valid and distinct species on the other."

Greene's opinion as to the absence of *P. amphibium* in America is again asserted, and the lack of herbaceous ocrea-borders in the European species is brought out. A new subdivision of the group, said to be based on a vast amount of field study, is proposed, together with two new species and one new variety. The paper includes lengthy discussions of various phases of the species described. The following synopsis of Nieuwland's treatment, which includes the sub-headings and lists of the species, has been prepared by the present writer, The plants are treated as belonging to the genus *Persicaria*, which Nieuwland traces back to Tragus in 1531.

Persicaria § Potamocallis.[2] Perennial plants typically amphibious, with rose-colored to crimson flowers (never white).

Subsection I. Emersae. Plants never having spreading herbaceous borders to the ocreae in any of the phases.

P. amphibia (L.) S. F. Gray. *P. coccinea* (Muhl.) Greene and var. *asprella* Greene. *P. pratincola* Greene. *P. vestita* Greene. *P. grandifolia* Greene. *P. rigidula* (Sheldon) Greene. *P. lonchophylla* Greene. *P. tanaeophylla* Nieuwland.

Subsection II. Hartwrightianae. Plants having more or less spreading herbaceous borders to the ocreae, usually in the terrestrial phase,[3] sometimes only in the terrestrial spring sterile and disappearing later.

[1] Nieuwland, *Our amphibious Persicarias*. Am. Midl. Nat. ii. 1–24, 200–247 (1911–12).

[2] Termed a subgenus in Nieuwland's summary.

[3] This sentence is taken verbatim from Nieuwland's paper.

P. carictorum Nieuwland. *P. mesochora* Greene and var. *arenicola* Nieuwland. *P. ammophila* Greene. *P. nebrascensis* Greene. *P. Hartwrightii* (A. Gray) Greene.

Subsection III. HYDROPHILAE. Provisional.[1] Plants as far as known without any terrestrial phase, deep water aquatics with glabrous slimy foliage. Spreading borders to the ocreae always absent.

P. fluitans (Eaton) Greene. *P. canadensis* Greene.

In investigating the influence of change of habitat, Nieuwland found it difficult to force terrestrial phases to aquatic life; the terrestrial plants died, he reports, on being put in water. He also failed to germinate the seed, and never found a single indubitable seedling. In view of the fact that the more typical members of the subgenus *Persicaria* produce large quantities of viable seeds, the latter observation is of some interest. The few achenes found in the panicles of these plants often appear imperfect, but from herbarium material it cannot be asserted that they would not have properly matured in nature, though there may be a strong suspicion to that effect. Irmisch[2] witnessed the germination of the European *Polygonum amphibium.*

Other writers besides Greene, and before as well as afterward, have given some attention to the nomenclatorial rank of the variations or forms of these plants.[3] The specific identity of *Polygonum Hartwrightii* and the American floating species was reported by Bissell,[4] who noticed the occurrence of the foliage of *P. Hartwrightii*

[1] (Footnote from the original.) This subsection will probably disappear as the members become better known or their terrestrial phases found. It may be that the plants have no terrestrial phase, however, and in that case it will remain, unless another more obvious method of division seem feasible.

[2] Irmisch, Bot. Zeit. xix. 105–109 (1861).

[3] In connection with the rather derisive views of the last two writers cited regarding the mentality of those who had presumed to denote them as "varieties" it might be pointed out that the varietal concept as a whole has been rather ill-defined, and that the early writers, particularly the Europeans, in denoting these subdivisions as "varieties" or by Greek letters which have been more or less generally translated with that significance, were not thereby expressing their ignorance of the nature and relationship of the various plants in question, which they usually understood fully as well as have their latter-day critics. It has usually been the aim of systematic botany to devise a system of categories to denote entities and relations in a readily comprehensible and succinct manner. The "var." or the Greek letter has simply been used in the past as a more or less non-committal way of denoting something recognizable, yet of less rank than a species. With the adoption of the International Code with its provisions for ranks below the specific, the situation is becoming somewhat clarified, and the term "forma" is coming into usage to denote ecological responses of the type here dealt with. Certainly there is nothing unscientific in the application of appropriate terminology to denote a recognizable entity.

[4] Bissell, *Biological Relationship of Polygonum Hartwrightii to P. amphibium,* RHODORA, iv. 104, 105 (1902).

and intergrading forms on the rhizomes or stems of the previously floating plant after a drouth in Shuttle Meadow Lake, Southington, Connecticut. He drew attention to analogous conditions in *Ranunculus multifidus* and its variety *terrestris* and *Myriophyllum ambiguum* and its variety *limosum*, and proposed the designation *P. amphibium*, var. *Hartwrightii*. He also noted that the land-form was notoriously sterile, it being a rare thing to find it in fruit in that region. The name as modified by Bissell was taken up by Robinson & Fernald in the seventh edition of Gray's Manual, with the note—

"Am ambiguous plant, sometimes clearly a mere terrestrial and mostly sterile state occurring on the same rootstock as the typical form, but elsewhere seemingly a normal and well-marked fertile variety."

Blake,[1] on the basis of Bissell's observations and his own, reduced the varieties *Hartwrightii* and *terrestre* to formae. The latter designation cannot hold, since forma *terrestre* (Leers) Blake is based nomenclatorially on the terrestrial form of the European, not the American species; but it appears to the present writer correct to preserve the viewpoint of Blake and to denote as formae the obviously ecological variations of the American as well as European amphibious Persicarias.

As to *P. coccineum*, Wiegand[2] has assigned its var. *aquaticum* Willd. to lower rank as *P. Muhlenbergii* forma *natans*. While the choice of this as a formal name may be deemed very unfortunate, in view of the priority of "*natans*" as a specific for the plant named by Eaton, and as a formal name under *P. amphibium* (or varietal in the long-established European usage), it is evidently, when transferred to *P. coccineum*, to be held valid under the International Code.

[1] Blake, Rhodora xv. 164 (1913).
[2] Wiegand, Rhodora, xxvi. 3 (1924).

(*To be continued*)

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CORTINARIUS CYANITES IN THE UNITED STATES.[1]

Louis C. C. Krieger.

(*Plates 151, 152.*)

On July 16, 1906, the writer was walking with some friends in a forest near Chocorua, New Hampshire. While discussing the colors of fungi, one of the party remarked, "I have never seen a blue mushroom." These words were scarcely uttered, when, much to our delight, a specimen of that hue was espied. It proved to be one of the rarest as well as one of the most beautiful of Cortinarii.

A colored sketch was prepared without delay (Pl. 151), and the following notes made.

"Cortinarius species. Single, young specimen. Chocorua, N. H. Among dead leaves. July 16, 1906. Grew on the left of the path that leads from the Chocorua River rustic bridge to Hayford's farm.

"Pileus (before expansion) 6 cm., convex, pale grayish-blue, smooth, appressedly and radiately fibrillose, the center inclining to a light, livid brown; the margin incurved and exceeding the gills, finely fibrillose, the fibrils interlaced and of a light cinnamon-brown (spores deposited?).

"Gills concolorous, but of a deeper shade of blue, quite close; edges very pale, crenulate.

"Stem 14 cm. long, 2.2 cm. thick at the apex, gradually enlarged downwards; basal bulb 5.5 cm. thick, tapering to a dull point. Exterior of stem concolorous, except at base which is reddish violaceous; all but the base covered with fibrils that are gathered together to form little, transverse, wave-like fascicles; apex not so rough; base smooth.

[1] Contribution from The Howard A. Kelly Mycological Library, Baltimore, Md.

"Coloring of interior. Flesh whitish at first, changing speedily to blood-red, finally to a dirty tint. The red color is especially noticeable in the base, from which a red juice can be pressed. Under the cortex of the median portion of the stem the blue is retained."

The spores were not measured, but their shape is shown in the plate. From the drawing it is also evident that they were uni- to tri-guttulate. Their color, as seen by transmitted light under the microscope, was a light yellow-brown. The epispore was smooth, not verrucose. The specimen was not kept, but the colored plate, from which the present reproduction was made, is preserved in the Howard A. Kelly Mycological Library.

With the aid of these notes, and the plate, the plant was identified as *Cortinarius cyanites* Fr. There are, however, several explainable discrepancies. Fries (5 and 6) says that the stem is smooth (laevigatus). His figure (7) represents a fully developed plant. The stem is without adornment, except in the lower, basal portion where a dense covering of light-blue fibrils appears in the contour of the figure that gives a general view. Gillet's plate (8), on the other hand, might have been drawn from our specimen, so close is the resemblance. The stem shows the peculiar, transverse fiber-fascicles. Further, the spores, according to Ricken (12), should be verrucose, yet, bearing in mind what Kauffman (9) says of Cortinarius spores in general ("when young the epispore is smooth"), it is clear that the plant was too immature to have developed this common Cortinarius character.

Secretan's description (13), under *Agaricus cyanus* Pers., apparently the first ever published, covers our plant, with unimportant differences. Berkeley and Broome (2) speak of it as a "magnificent species," and as "one of the finest of the genus." Rea (11) says the stem is fibrillose. Bataille's plant (1) is ours. Quélet (10) regards it as a luxuriant variety of *C. alboviolaceus*.

Having determined the plant to our satisfaction, it was discovered that *C. cyanites* is mentioned but once in American mycological literature, so far as we could learn. In 1903, my esteemed colleague, Miss Jennie F. Conant, secretary of the Boston Mycological Clue, published the name in a list of fungi exhibited at Horticultural Hall, Boston, during the summer and autumn of 1902 (3). Miss Conant has since informed the writer that the Club's herbarium contains four specimens of the species, only one of which is mature. They

were collected at Alstead, N. H., July 25, 1902, by my friend, Mr. Hollis Webster, who states (in litt.): "I cannot remember whether Dr. Farlow had a specimen. The determination was mine originally, but probably he confirmed it." The late Mr. George B. Fessenden, whose name appears on the herbarium label, and who, for many years, was president of the Boston Mycological Club, merely communicated the plants to one of that year's exhibitions.

The Club's herbarium also preserves a lantern-slide from a negative made by Mr. Webster, showing three of the specimens in the fresh state. The figures (Pl. 152), made from this slide, demonstrate that the Alstead and Chocorua plants are unquestionably identical as to external structure. The figure of the fully developed plant, on the extreme left of our plate, shows that the roughness on the stems of young specimens disappears with age.

Through the kindness of Miss Conant, the writer was permitted to examine a fragment of a gill from this mature specimen. Under a one-twelfth, oil-immersion objective, the spores were seen to vary as to roughness, younger ones showing a smooth epispore, while fully matured ones were tuberculate. Some, of intermediate size, were part rough and part smooth. Frequently the roughness would appear as a granulation within, while the contour, in optical section, was perfectly smooth. They measured $5.5–6.6 \times 10\ \mu$. Cooke's measurements (4) are $5–6 \times 10\ \mu$.

On the basis of the above facts, it is safe to claim this extremely rare and exceptionally beautiful Cortinarius as a United States species.

1406 Eutaw Place, Baltimore, Md.

Explanation of Plates

Pl. 151. *Cortinarius cyanites* Fr. from Chocorua, N. H. Reproduced from a photograph of the writer's painting of the actual specimen.

Fig. 1. Young plant, Fig. 2. Section of the same. Fig. 3. The spores.

Pl. 152. *Cortinarius cyanites* Fr. from Alstead, N. H. Reproduced from a photograph made from a lantern-slide.

Fig. 1. Mature specimen. Fig. 2 and 3. Younger specimens.

Literature cited

1. **Bataille, F.** Flore monographique des Cortinaires d'Europe. Besançon, 1912. p. 57.
2. **Berkeley, M. J. and Broome, C. E.** Notices of British fungi. Ann. and Mag. of Nat. Hist., ser. 4, vol. *17*, p. 133. 1876.

3. **Conant, J. F.** In Bull. *19,* Boston Mycological Club. 1903.
4. **Cooke, M. C.** Handbook of British fungi. 2 ed. London, 1883. p. 252.
5. **Fries, E. M.** Epicrisis. Upsala, 1836–1838. p. 279.
6. " " " Hymenomycetes Europaei. Upsala, 1874. p. 360–361.
7. " " " Icones. Upsala and Stockholm, 1867–1884. pl. 152, fig. 1.
8. **Gillet, C. C.** Champignons de France. Hyménomycètes. Paris, 1878– . pl. 320.
9. **Kauffman, C. H.** Agaricaceae of Michigan. 1918. p. 317.
10. **Quelet, L.** Flore mycologique de la France. Paris, 1888. p. 147.
11. **Rea, C.** British Basidiomycetae. Cambridge, 1922, p. 155.
12. **Ricken, A.** Die Blätterpilze. Leipzig, 1915. p. 150, pl. 44, fig. 2.
13. **Secretan, L.** Mycographie Suisse. Geneva, 1833. vol. *1*, p. 154–155.

THE AMPHIBIOUS GROUP OF POLYGONUM, SUBGENUS PERSICARIA.

E. E. Stanford.

(*Continued from page 152.*)

KEY TO THE AMPHIBIOUS PERSICARIAS OF EUROPE AND AMERICA.

Plants perennial, more or less amphibious: flowers dimorphous as to stamens; these members accordingly strongly exserted or much reduced and included; the two types usually segregated on different plants; long-stamened flowers almost invariably sterile and the short-stamened frequently so.

a. Aquatic forms; stems floating or somewhat emersed: leaves glabrous (becoming more or less hirsute in transition-forms), elliptic or oval *b*.

b. Margins of leaves armed with short harsh bristles 1a. *P. amphibium* f. *natans*.

b. Margins naked or with weak hairs or bristles *c*.

c. Peduncle glabrous: panicle ovoid, 1–5 cm. long

Panicle 1–3 cm. long: fruiting calyx not over 6 mm. long . . . . . . 2a. *P. natans* f. *genuinum*.

Panicle 4–5 cm. long: fruiting calyx 6–7 mm. long 2c. *P. natans* var. *insigne*.

c. Peduncle hairy: panicle cylindric, 3–10 cm. long

Leaves mostly cordate: internodes not inflated nor tapering upward . . . . . . 3b. *P. coccineum* f. *natans*.

Leaves mostly rounded or acutish at the base: internodes inflated or tapering upward . . 3c. *P. coccineum* var. *rigidulum*.

a. Terrestrial forms; stems upright and leafy: leaves rarely glabrous, mostly more or less hairy *d.*
d. Ocreae without herbaceous margin *e.*
e. Leaves harshly scabrous with short (1 mm. or less) stiff hairs........................1b. *P. amphibium* f. *terrestre.*
e. Leaves glabrous or pubescent or hirsute with weak hairs (mostly 1–2 mm. long)
Panicles mostly 4–18 cm. long: petioles mostly attached midway of the ocreae; plant usually rather densely (often minutely) pubescent or canescent 3d. *P. coccineum* var. *pratincola.*
Panicles mostly 4–8 cm. long: petioles attached near the base of the ocreae: plant very variable as to pubescence, sometimes nearly glabrous (except the peduncle).....................3a. *P. coccineum* f. *terrestre.*
d. Ocreae with herbaceous margins........2c. *P. natans* f. *Hartwrightii.*

1. Polygonum amphibium L. Sp. Pl. 361 (1753). Perennial; aquatic, emersed, or terrestrial.

1a. Forma **natans** (Moench), comb. nov. Stems rhizomatiform, floating, submerged, or on the bottom of ponds, lakes, etc., becoming erect as the plant passes to the forma *terrestre,* rooting at the somewhat constricted nodes; internodes 5–10 cm. long.

Leaves floating, elliptic-lanceolate, 2–4 cm. wide, 8–12 cm. long, coriaceous, glabrous on both surfaces, shining above; base acute and slightly inequilateral, rounded, truncate, or slightly cordate; apex acute or obtuse when young, becoming obtuse; margin entire or slightly undulate, usually armed with short stout appressed bristles and harsh to the touch, rarely naked; lateral veins of mature leaves nearly straight and meeting the mid-vein nearly at right angles; petioles 3–8 cm. long, slender, flexuous, flattened, attached at the central or upper portion of the ocrea.

Ocreae 1–2 cm. long, thin-membranous, glabrous, rounded-truncate, eciliate.

Inflorescence erect, usually single, occasionally with subordinate branches: peduncle glabrous: panicle dense-flowered, cylindric, 1–5 cm. long: ocreolae 3–4 mm. long, thin-membranous, inconspicuous, rounded-rhombic or deltoid: fascicles 2–3-flowered, the bracts persistent, thin-membranous: flowers heterostyled, the types usually on separate plants; pedicels mostly 1 mm. long or less.

Long-styled flowers. Calyx pink or rose, 3–4 mm. long, 5-parted to about ¾ its length; the segments rounded, narrow-ovate: calyx opening briefly, becoming slightly accrescent and flattened-ovoid in fruit: stamens 5, much reduced, about 1.5 mm. long; anthers shrunken, nearly or quite devoid of pollen: style 3.5–4 mm. long, two-parted to below the middle; the lobes exserted about 1 mm. and diverging: stigmas capitate: nectaries 5, below and alternating with the filaments.

Short-styled flowers. Opening more widely: stamens 3.5–4.5 mm. long, strongly exserted; anthers usually fully polliniferous: ovary reduced: style 3 mm. long, its tips with the flattened-capitate stigmas slightly exserted: pollen usually normal.

Achene 2–2.2 mm. wide, 2.5–3 mm. long, nearly orbicular, much exceeded by the calyx, minutely protuberant at base, thick-lenticular, minutely roughened and rather dull.

P. amphibium var. *natans* Moench, Enum. Pl. Hassk. 28 (1777), not *P. amphibium* Michx. and Am. authors.

Widespread in slow waters throughout Europe.

1b. Forma TERRESTRE (Leers) Moss. Camb. Brit. Fl. ii. 115 (1914). Emersed or growing on margins of ponds, rivers, or wet places, more rarely in dry localities. Branches upright from a repent or rhizomatiform stem, often appearing on extensions of an aquatic stem in shallow water or on banks; internodes 4–5 cm. long.

Leaves lanceolate, 1–3 cm. wide, 10–18 cm. long, subcoriaceous; upper surface and margin scabrous with close appressed short (1 mm. or less) stiff sharp bristles; lower surface less scabrous with weaker bristles; bases cuneate, rounded, or narrowly cordate; apex long-attenuate; leaves borne at an acute angle on a short (0.5–1 cm.) stiff petiole from near the top of the ocrea.

Ocreae 1.5–2.5 cm. long, closely cylindric, wrinkled, minutely strigose; the margin above the attachment of the petiole scarious and tending to disappear in part, leaving the vascular bundles projecting like cilia: ocreae sometimes adherent to or coalescent with the epidermis.

Inflorescence (rarely produced and then mostly sterile) usually a single terminal panicle, sometimes with subordinate branches: peduncles minutely hairy: the hairs often with inconspicuous glandular tips.

Polygonum amphibium var. *terrestre* Leers, Fl. Herborn. 98 (1775) and of European authors; not of S. F. Blake, RHODORA, xv. 164 (1913), which is *P. natans*, forma *Hartwrightii*. *Persicaria amphibia* var. *terrestre* S. F. Gray, Nat. Arr. Brit. Pl. ii. 268 (1821).

Emersed or terrestrial, common throughout Europe. A single introduction known in North America, which is represented by the following: NOVA SCOTIA: roadside bank in rubbish near railroad, Yarmouth, September 1, 1920, *Bissell, Long & Linder*, no. 21,064.

2. P. NATANS A. Eaton, Man. Bot. ed. 3: 400 (1822). Perennial: aquatic, emersed, or terrestrial.

2a. Forma **genuinum.** Stems floating or more or less submersed and rooting at the bottom, becoming erect and passing into the forma *Hartwrightii* in shallow water, rhizomatiform, 0.5–0.7 cm. in diameter; nodes slightly swollen; internodes 5–10 cm. long.

Leaves elliptic or elliptic-oval, becoming lanceolate as the plant approaches the forma *Hartwrightii*, 2–4 cm. wide, 7–12 cm. long, thinly coriaceous, glabrous on both surfaces, shining above, often reddened; base rounded, or somewhat inequilaterally acute at the junction with the petiole; apex rounded, more rarely acute; margin entire, usually unarmed, becoming weakly scabrous with short appressed hairs in transition forms; side veins of mature leaves meeting the midvein at an angle of about 60° and curving toward

the margin: petioles slender, flexuous, flattened, 1–6 cm. long, attached to the upper portion of the ocrea.

Ocreae thin-scarious, close-cylindric, obliquely truncate; the margin scarious or in transition forms becoming herbaceous.

Inflorescence erect, usually a single panicle, or occasionally with the peduncle giving off inferior branches below; peduncle glabrous, 5–6 cm. long, much ridged in drying: panicle 1–3 cm. long, ovoid or short-cylindric, dense-flowered: ocreolae 3–4 mm. long, elongate-triangular and acute, thin-membranous, inconspicuous: flowers heterostyled, the types usually segregated on separate plants.

Long-styled flowers. Calyx pink or reddish, 3–4 mm. long and narrow-ovoid, becoming slightly longer and broader-ovoid in fruit, 5-parted to below the middle; the lobes rounded: stamens 5, usually much reduced, 1–2 mm. long; anthers shrunken and mostly devoid of pollen, included: style 3–4 mm. long, 2-parted nearly to the middle; the branches exserted and diverging; stigmas capitate: nectaries 5, alternating with and below the attachment of the filaments.

Short-styled flowers. Opening more widely and more or less permanently: stamens 4–6.5 mm. long, strongly exserted: anthers fully polliniferous and soon deciduous: ovary reduced, rarely or never developing further: style 3–3.2 mm. long: the branches and stigmas exserted but usually less so than the stamens: pollen usually with a considerable proportion of defective grains.

Achene 2.5–2.7 mm. wide, 2.5–2.7 mm. long, nearly orbicular, thick-lenticular, minutely pitted and rather dull; the faces strongly convexed; the base slightly constricted or disciform.

Polygonum natans A. Eaton, Man. Bot. ed. 3: 400 (1822), ed. 4: 404 (1824), ed. 5: 338 (1829). *P. fluitans* Eaton, Man. ed. 6: 274 (1833), ed. 7: 450 (1836); Eaton & Wright, N. A. Bot. 368 (1840). *P. coccineum* Bigelow, Fl. Bost. ed. 2: 157 (1824); not Muhl. in Willd. Enum. Hort. Berol. 1809). *P. amphibium* var. *natans* Michaux, Fl. Bor. Am. i. 240 (1803); Meisner, Monog. Gen. Polyg. Prodr. 67 (1826); Hooker, Fl. Bor.-Am. ii. 131 (1838); Wood, Cl. Bk. Bot. 324 (1845); not Moench, Enum. Pl. Hass. 28 (1775). *P. amphibium* var. *aquaticum* Torrey, Fl. No. & Mid. U. S. i. 404 (1824) and Comp. Fl. No. & Mid. States 172 (1826); Beck, Bot. N. & Mid. States, 30 (1833); Gray, Man. 388 (1848), ed. 5: 416 (1867); Wood, Cl. Bk. Bot. 609 (1880); not Leysser, Fl. Hals. ed. alt. 95 (1783). *P. amphibium* Small, Monog. N. A. Polyg. 40, t. 7 (1895); Robinson & Fernald in Gray, Man. ed. 7: 360 (1908); and many other Am. authors, not L. Sp. Pl. 361 (1753). *Persicaria fluitans* (Eaton) Greene, Leaflets, i. 26 (1904). *P. plattensis* Greene, loc. cit. 29 (1904). *P. oregana* Greene and *P. lactevirens* Greene, loc. cit. 31 (1904). Probably including others of Greene's species of which types have not been available.

In pools and slow waters, Newfoundland, Prince Edward Island, Magdalen Islands, Nova Scotia, Quebec, southward to Pennsylvania

and across the continent; in the Pacific States southward to and throughout California.

The following are characteristic. Newfoundland: sandy and gravelly shores of ponds, headwaters of Rocky River, Avalon Peninsula, *Fernald & Wiegand*, no. 5369; shallow pool near river, Bishop Falls, *Fernald & Wiegand*, no. 5348; shallow water near margin of Rushy Pond, *Fernald & Wiegand*, no. 5350. Quebec: dried-up swampy hole, mouth of Grand River, Gaspé County, *Collins, Fernald & Pease*, no. 5271. Magdalen Islands: edge of pond in sand dunes, Brion Island, *St. John*, no. 1861. Prince Edward Island: shallow border of Cousin's Pond, Malpeque, *Fernald & St. John*, no. 200. Nova Scotia: beach of Shubenacadie Grand Lake, Halifax Co., *Fernald, Bartram & Long*, no. 23,791; in water of marsh, near Pictou, *Howe & Lang*, no. 474; in Plaster-hole Lake, vicinity of Dingwall, *Nichols*, no. 1036. Maine: Pettiquaggamas (Glazier) Lake, Aroostook Co., *Fernald*, no. 95; Lake Christopher, Woodstock, July, 1887, *Parlin*. Vermont: Walden, July 4, 1894, *Eggleston;* Castleton, October 3, 1897, *Eggleston*. Massachusetts: Hinsdale, *S. F. Poole*, no. 288. Connecticut: Southington, *Bissell*, no. 503; Crescent Lake, *Luman Andrews*, no. 7; Flanders Pond, *Andrews*, no. 2; Beaver Pond, Meriden, *Andrews*, no. 17. New York: Pool northeast of Spencer Lake, Spencer, Tioga Co., *Eames*, no. 3993; partly dried-out soil, Slaterville Swamp, Caroline, Tompkins Co., *Wiegand*, no. 11,972; in water, Chicago Bog, Cortland, Cortland Co., *Eames & Macdaniels*, no. 407; Racquette River, *C. S. Phelps*, no. 398. Minnesota: Oshawa, Nicollet Co., July, 1892, *C. A. Ballard*. Iowa: Kossuth County, *Cratty & Pammel*, no. 609. North Dakota: Dickinson, September 10, 1908, *W. H. Holgate*. Alberta: near Banff, *Macoun*, no. 1481; prairie ponds, Elbow River District, vicinity of Calgary, *M. E. Moodie*, no. 1061. Saskatchewan: *E. Bourgeau*, 1857–8. Montana: Hound Creek, *Scribner*, no. 237; Flathead, *MacDougal*, no. 461; Cliff Lake, alt. 7000 ft., *Rydberg & Bessey*, no. 5358. Wyoming: Two Ocean Lake, *Merrill & Wilcox*, no. 1095; bogs, Dunn's Ranch, Albany County, *A. Nelson*, no. 7465. Colorado: Gunnison, alt. 7680 feet, *Baker*, no. 906. Idaho: trailing, in marshes, Falk's Store, Canyon Co., *Macbride*, no. 291; shallow water, St. Anthony, *Merrill & Wilcox*, no. 848. Nevada: Lake Washoe, *J. Torrey*, no. 427. California: borders of ponds, Bear Valley, San Bernardino Mts., *Parish*, no. 1405a; Donner Lake, Nevada Co., *Heller*, no. 7162; Cuyamaca Lake, *Abrams*, no. 3846. Oregon: Klamath Marsh, alt. 1530 m., *Leiberg*, no. 628; tule of Grande Ronde, *Cusick*, no. 1763; near Ashland, *Applegate*, no. 604; lower Albina, Portland, *Sheldon*, no. 11,327. Washington: Calispel Valley, *Kreager*, no. 338.

The above were mostly distributed as *P. amphibium*.

2b. Forma **Hartwrightii** (Gray), comb. nov. More or less erect from a rhizomatiform stem; the upright stems much branched and leafy, with a variable degree of pubescence or hirsuteness.

Leaves lanceolate, 1–4 cm. wide, 10–15 cm. long, herbaceous, opaque, often glabrous except near the margin, or more or less densely clothed (in the less hairy forms near the margin chiefly) with weak slender flexuous hairs 1–2 mm. long, and rising from somewhat expanded bases; bases rounded or slightly cordate; apex acute or attenuate: margin entire, clothed with slender or slightly harsh hairs; petioles very short (usually 0.5 cm. or less), stout, attached to the middle or lower half of the ocrea.

Ocreae close-cylindric, firmly membranous, 1–2.5 cm. long, wrinkled, hirsute; margins salver-form, herbaceous, and more or less reflexed, about 1 cm. in diameter; the salver-form appendage occasionally wanting.

Inflorescence (rare and usually sterile) mostly terminal.

Polygonum Hartwrightii Gray, Proc. Am. Acad. viii. 294 (1870); Watson, Bot. Calif. ii. 14 (1880); Watson & Coulter in Gray, Man. ed. 6: 441 (1890); Small, Monog. N. A. Polyg. 42, t. 8 (1895); Britton & Brown, Ill. Fl. i. 555 (1896). *Polygonum amphibium* var. *Hartwrightii* Bissell, Rhodora iv. 104 (1902); Robinson & Fernald in Gray, Man. ed. 7: 361 (1908). *Polygonum amphibium* forma *Hartwrightii* (Gray) Blake, Rhodora xv. 164 (1913). *Polygonum amphibium* forma *terrestre* Blake, loc. cit. (1913); Farwell, Ann. Rept. Mich. Acad. Sci. xxi. 365 (1920); not Moss, Camb. Brit. Fl. ii. 115 (1914). *Polygonum amphibium* var. *marginatum* Farwell, Ann. Rept. Mich. Acad. Sci. xxi. 365 (1920). *P. amphibium* var. *marginatum* forma *Hartwrightii* Farwell, loc. cit. (1920). *P. amphibium* var. *marginatum* forma *hirtuosum* Farwell in Papers Mich. Acad. Sci. i. 93 (1923). *Persicaria Hartwrightii* (Gray) Greene, Leaflets i. 24 (1904); probably also *P. abscissa*, *P. asclepiadea*, *P. nebrascensis*, *P. ammophila*, *P. muriculata*, *P. homalostachya*, *P. villosula* and *P. chelanica* Greene, loc. cit., p. 17–50, and *P. carictorum* Nwd. Am. Midl. Nat. ii. 230 (1912).

In swamps, wet places, and sometimes in dry prairies throughout the range of the forma *genuinum;* apparently replacing it, or at least more conspicuous, throughout the middle west and in the Mississippi valley. The following are characteristic. Newfoundland: stranded on wet sandy shore of Rushy Pond, *Fernald & Wiegand*, no. 5351. Quebec: vicinity of Longueuil, emersed, *Victorin*, no. 4263; mouth of Grand River, Gaspé County, August 11–15, 1904, *Collins, Fernald & Pease.* Magdalen Islands: edge of pond in sand dunes, Brion I., *St. John*, no. 1860. Prince Edward Island: swale near margin of North Lake, Kings Co., *Fernald, Long & St. John*, no. 7382; swampy margin of Cozen's Pond, *Fernald & St. John*, no. 11,048. Lower Sea Cow Pond, *Fernald & St. John*, no. 7380. Maine: wet thicket, Dover, September 11, 1894, *Fernald;* river bank, Van Buren, Septeember 18, 1900, *Fernald.* Vermont: Perch Pond, Pownal, *Eggleston*, no. 329. Massachusetts: Fresh Pond, Cambridge, September, 1878, *Farlow.* Connecticut: Beaver Pond, Meriden, *Luman Andrews*,

no. 17; Shuttle Meadow Lake, Southington, *Andrews*, no. 8. Ontario: marshes, Point Edward, *J. Macoun*, no. 54,744. New York: a series of sheets by *S. H. Wright*, Dundee, Yates Co., and no doubt the Gray types; Lowery's Pond, Junius, *Metcalf*, no. 6459. Indiana: swamp land, Wolf Lake, *Smith*, no. 5729. Michigan: banks of Indian River, Cheboygan Co., August 12, 1890, *C. F. Wheeler*. Wisconsin: Green Bay, August 16, 1899, *J. H. Schuette*. Illinois: drained swamp near Wady Petra, *Chase*, no. 191; Fountaindale, *Bebb*. Minnesota: Center City, August, 1892, *B. E. Taylor*. Iowa: Ames, August 8, 1874, *C. E. Bessey*. Nebraska: 3 mi. northwest of Whitman, *Rydberg*, no. 1293. Colorado: swampy river bottom, Bedrock, Montrose Co., *Walker*, no. 371. Montana: banks of Missouri River, alt. 3100 feet, *Scribner*, no. 238 (as *P. Muhlenbergii*). Idaho: Priest Lake, *Piper*, no. 3717. Utah: Rabbit Valley, alt. 6700 feet, *Ward*, no. 617. Lower California: Cantillas Mts., *Orcutt*, no. 898.

The above were mostly distributed as *P. Hartwrightii* and *P. amphibium.*

2c. Var. **insigne** (Greene), comb. nov. An extremely robust variety, seen only in the aquatic form. Leaves 3–5 cm. wide, 6–12 cm. long; the lower cordate at the base: panicles 2 cm. thick, 4–5 cm. long: fruiting calyx 3 mm. wide, 7 mm. long: achene scarcely larger than in the type; style-base notably stiff, breaking to leave the achene with a spine-like point: pollen somewhat defective.

Persicaria insignis Greene, Leaflets, i. 32 (1904).

California. The following are typical. California: aquatic, subalpine, 9180 ft. alt., September 20, 1889, locality not stated, *Wright;* near Lake Tahoe in water ("this variety is common on the eastern slope of the Sierras but very rare west of the crest"), August 29, 1863, *Brewer* no. 2156.

3. Polygonum coccineum Muhl. in Willd. Enum. Hort. Berol. i. 428 (1809). Perennial; aquatic, emersed, or terrestrial, the latter states the more common.

3a. Forma **terrestre** (Willd.), comb. nov. Emersed or terrestrial: stem becoming erect from a more or less repent or rhizomatiform base, coarse, 1–1.5 m. high, striate, much branched, and leafy, mostly glabrous below, becoming pubescent or clothed with simple or glandular hairs above; nodes much swollen; internodes 4–10 cm. long.

Leaves lanceolate or ovate-lanceolate, 3–6 cm. wide, 10–18 cm. long, herbaceous, subcoriaceous or coriaceous; base rounded, slightly cordate or sometimes cuneate; apex acute or acuminate; margin entire, scabrous with minute appressed bristles; surfaces glabrous with minute bristle-teeth on veins on emersed plants, becoming hairy in varying degrees in those of terrestrial habitat; lateral veins forming an angle of about 60° with the midvein and curving toward the margin; petioles stout, 3–6 cm. long, attached near the base of the ocrea.

Ocreae 2–3.5 cm. long, thin-membranous, appearing inflated at the node, close-cylindric above, sometimes becoming coalescent with

the epidermis, fine-pubescent or hirsute; margin truncate, entire or short-ciliate.

Inflorescence usually terminal, erect: panicle single or more than one, with the lower smaller: peduncles 3–7 cm. long, stout, pubescent with appressed or glandular hairs, or the two mixed: panicles close-cylindric, spicate, 3–10 cm. long.

Ocreolae 3–4 mm. long, rather crowded, brown or reddish, acute, hirsute and fringed with rather stiff appressed hairs: bracts persistent, thin-membranous: fascicles 3–4 flowered: pedicels 1–2 mm. long, scarcely exserted.

Flowers scarlet or pink, heterostyled; the types usually segregated on different plants; the long-styled panicles usually with a low percentage of achene-production; short-styled almost invariably sterile.

Long-styled flowers. Calyx 5-parted, 3–3.5 mm. long, becoming 4–5 mm. in fruit, mostly narrow-ovoid and closed, or opening briefly: stamens 5, 1.5–2 mm. long; anthers reduced and mostly empty: style 3.5–4 mm. long, 2-parted to below the middle, the tips with the capitate stigmas strongly exserted (about 2 mm.): nectaries prominent, alternating with and below the filaments.

Short-styled flowers. Stamens 4–5 mm. long, exserted nearly half their length; anthers usually fully polliniferous (sometimes scantily so); pollen usually with a considerable percentage of defective grains: style 2.5–3 mm. long, exserted.

Achene 2.5–3.3 mm. long, 2.5–3 mm. wide, thick-lenticular, orbicular or broader toward the top, tapering or slightly disciform at base, minutely roughened, opaque, much exceeded by the accrescent calyx.

P. coccineum Muhl. l. c. (1809) and Cat. 40 (1813); Pursh, Fl. Amer. Sept. i. 271 (1814); Nuttall, Gen. N. A. Pl. 255 (1817); A. Eaton, Man. Bot. ed. 2: 259 (1818); Eaton & Wright, N. A. Bot. 368 (1840); Barton, Comp. Fl. Phila. i. 188 (1818); Sprengel, Syst. ii. 259 (1825). *P. coccineum* var. *terrestre* Willd. Enum. Hort. Berol. i. 428 (1809); Pursh, loc. cit. *P. amphibium* Michx. Fl. Bor.-Am. i. 240 (1803), in part; Bigelow, Fl. Bost. ed. 2: 157 (1824); Wood, Cl. Bk. Bot. 324 (1845); Darlington, Fl. Cestr. ed. 3: 246 (1853); not L. Sp. Pl. i. 361 (1753). *P. amphibium* var. *emersum* Michx. loc. cit. (1803). *P. amphibium* var. *terrestre* Torr. Fl. N. & Mid. St. i. 403 (1824); Comp. Fl. No. & Mid. St. 172 (1826); Fl. N. Y. ii. 148 (1843); Meisner, Monog. Gen. Polyg. Prodr. 67 (1828); Darlington, Fl. Cestr. 250 (1837); Hooker, Fl. Bor.-Am. ii. 131 (1839); Gray, Man. 388 (1848); ed. 5: 416 (1867); not Leers, Fl. Herb. 99 (1775). *P. amphibium* var. *Muhlenbergii* Meisner in DC. Prodr. xiv. 116 (1856). *P. amphibium* var. *longispicatum* Peck Ann. Rept. State Bot. N. Y. 1892: 48 (1893). *P. amphibium* var. *coccineum* (Muhl.) Farwell, Ann. Rept. Mich. Acad. Sci. 6: 206 (1904). *P. Muhlenbergii* (Meisn.) Watson, Proc. Am. Acad. xiv. 295 (1879); Watson & Coulter in Gray, Man. ed. 6: 441 (1890); Robinson & Fernald in Gray Man.

ed. 7: 361 (1908). *P. emersum* (Michx.) Britton. Trans. N. Y. Acad. Sci. viii. 73 (1889); Small, Monog. N. A. Polyg. 44 (1895). *P. terrestre* BSP. Prelim. Cat. N. Y. 46 (1888). *Persicaria emersa* (Michx.) Small, Fl. Se. U. S. 376 (1903). *P. coccinea* (Muhl.) Greene, Leafl. i. 24 (1904); Rydberg, Fl. Rocky Mts. 236 (1917). *P. Muhlenbergii* (Meisn.) Small in Rydberg, Fl. Colo. 11 (1906). *P. novae-angliae* Greene, loc. cit. 34 (1904) and probably others of Greene's species of which types are not available.

The following are referred here. Quebec: terrains submergés au printemps, Ile Plate, près de Longueuil, *Victorin*, no. 15,777. Nova Scotia: rocky swale bordering Dominick Lake east of Springhaven, *Fernald & Long*, no. 23,793; wet savannah bordering Butler's (Gavelton) Lake, Gavelton, *Fernald & Long*, no. 21,065. Maine: muddy shore, Orono, September 4, 1893, *Fernald*. Massachusetts: Small pond at Cataumet, September 15, 1901, *E. F. Williams;* edge of Charles River, in mud and water, Dedham, September 5, 1898, *F. G. Floyd.* Connecticut: Misery Swamp, Southington, *Andrews* no. 1 (in part); East Hartford, September 29, 1902, *A. W. Driggs.* New York: outlet of Crooked Lake, in dry places as well as muddy, *S. H. Wright;* western central New York, *A. Gray;* Cayuga Marshes, north of R. R. bridge, Seneca Falls, *Thomas*, no. 3994; pool near Fleming Schoolhouse, Ithaca, *Wiegand & Thomas*, no. 2234. New Jersey: swamp near Rosenkranz Ferry, Sussex Co., September 13, 1921, *E. B. Bartram.* Pennsylvania: South river shore, Haines, Lancaster Co., September 1, 1909, *Van Pelt;* in Catskill formation, about Long Pond, Luzerne Co., *Heller & Hallbach*, no. 666. Virginia: Hunting Creek Marsh, Alexandria, *Shull*, no. 236. Ontario: swamp, Peele Island, August 21, 1914, *MacDaniels & Eames.* Michigan: wet sandy border of Douglas Lake, Cheboygan Co., *Ehlers*, no. 234. Ohio: Oxford, Erie Co., September 2, 1895, *E. L. Moseley.* Illinois: wet soil, Skokie Marsh, Glencoe, August 26, 1911, *E. E. Sherff.* Iowa: Ames, *E. Johnson*, no. 622. Arkansas: Hornersville, *Metcalf*, no. 642. Alberta: prairie slough, Castle Hill District, *Moodie*, no. 1144. Montana: Bitter-root valley, near Frenchtown, *S. Watson*, no. 342, California: small pond north of Napa, *Suksdorf*, no. 723; Los Angeles. July, 1879, *Nevin.* Oregon: swamps, Swan Lake, Klamath Co., *Applegate*, no. 603; tules of Grande Ronde, *Cusick*, no. 1764. Washington: White Salmon, *Suksdorf*, no. 481.

3b. Forma **natans** (Wiegand), comb. nov. Stems floating or more or less submerged and rooting at the bottom: leaves 4–7 cm. wide, 10–15 cm. long, coriaceous or subcoriaceous, glabrous or glabrescent, ovate-lanceolate or lanceolate, cordate or rounded at base, acute (rarely obtuse); margins and ocreae eciliate; peduncles usually glandular-hairy. The specimens seen mostly sterile.

Polygonum coccineum var. *aquaticum* Willd. Enum. Hort. Berol. 428 (1809). *P. Muhlenbergii* forma *natans* Wiegand, Rhodora, xxvi. 3 (1924). Descriptions in literature cited under the forma

terrestre are usually broad enough to include this form. *Persicaria plattensis* Greene, Leaflets i. 29 (1904) in part; *P. alismaefolia* Greene, loc. cit. and probably other species there described, the types of which have not been seen and the descriptions of which do not justify definite disposal.

Occasional throughout the range of the typical form, but much less common, particularly in the region of the upper Mississippi basin. The following specimens are typical. QUEBEC: in dried pool, vicinity of Longueuil, *Victorin*, no. 4264. MAINE: Lake Christopher, Woodstock, 1887, *Parlin*. MASSACHUSETTS: Water Shop Pond, Springfield, *Andrews*, no. 6; Readville, *C. E.. Faxon*. CONNECTICUT: Middlefield, August 22, 1907, *Andrews;* Misery Swamp, Southington, *Andrews*, no. 1 in part; Sleeper Pond, *Andrews*, no. 16; Boody Pond, *Andrews*, no. 18. Lake Saltonstall, New Haven, *D. C. Eaton;* East Hartford, September 13, 1897, *A. W. Driggs*. NEW YORK: western N. Y., *A. Gray*. WISCONSIN: Namekagon River, August 30, 1831, *Houghton*. SOUTH DAKOTA: vicinity of Brookings, July 9, 1896, *T. A. Williams*. WYOMING: ponds along river, Dunn's Ranch, Albany County, *A. Nelson*, no. 7598; Fairbanks, *A. Nelson*, no. 551. COLORADO: ponds, alt. 8000 feet, Tabegauche Basin, *Payson, no.* 173. CALIFORNIA: muddy bottomland, Owens River, Inyo Co. (eaten greedily by hogs), August, 1906, *S. P. Rexford;* banks of Russian River north of Cloverdale, Mendocino Co., *Heller*, no. 5283; about Mendocino, *Brewer*, no. 931. OREGON: standing water on Sauvies Island, Multnomah Co., *J. C. Nelson*, no. 4443; wet meadows, Union Co., *Cusick*, 1878. WASHINGTON: Seattle, from *Herb. Young Naturalist's Soc.;* Pen d'Oreille River, *Dr. Lyall*.

The above were distributed as *P. Muhlenbergii*, *P. emersum* and *P. amphibium*.

3c. Var. **rigidulum** (Sheldon), comb. nov. An aquatic and emersed form; internodes of floating stems much swollen, 0.5–1.5 cm. in diameter and 10–15 cm. long; the nodes constricted; emersed portions with the nodes more or less swollen and the internodes tapering upward: leaves sharply lanceolate, very glabrous, or the upper becoming minutely but densely pubescent; bases rounded, rather inequilateral; petioles 5–10 cm. long, attached near the base of the ocrea; ocreae 1–5 cm. long, nearly glabrous, often coalescent with the epidermis; peduncle and ocreae minutely and densely glandular-hairy.

Polygonum rigidulum Sheldon, Bul. Geol. Nat. Hist. Surv. Minn. ix. 14 (1894). *Persicaria rigidula* (Sheldon) Greene, Leaflets i. 39 (1904); Nieuwland, Am. Mid. Nat. ii. 225 (1912). Ontario, Minnesota and South Dakota.

The following are referred here. ONTARIO: Massacre, *Macmillan & Sheldon*, no. 2407 (as *P. Muhlenbergii*). MINNESOTA: "From type coll." Nicollet, Nicollet Co., July, 1892, *C. A. Ballard*.

3d. Var. **pratincola** (Greene), comb. nov. Terrestrial, more or less minutely canescent or pubescent with weak simple or simple and

glandular hairs: petioles mostly attached midway of the ocreae: ocreae mostly sharply acute and densely hairy: panicles narrowly cylindric and averaging somewhat longer than the type, the long-styled with a somewhat greater percentage of fertility than is usually found in the type; pollen of short-styled flowers mostly normal.

Persicaria pratincola Greene, Leaflets. i. 36 (1904). *P. spectabilis* Greene and *P. aboriginum* Greene, loc. cit. 37–44, and probably others of Greene's species of which types are not available. Indiana to the Dakotas, south to Texas and Mexico, in swamps or sand.

The following are referred here. Indiana: Gibson, *Lansing*, no. 2831. Wisconsin: Lapham. Illinois: sand-dunes, Havana, August 12, 1893, *Gleason*. Minnesota: Lindstrom, Chicago Co., August, 1892, *Taylor;* near Moorhead, Red River Valley, *Ballard*, no. 2951. Missouri: low sandy bottoms, common, Jackson Co., *Bush*, no. 328; low prairie, Dodson, *Bush*, no. 4150; rich bottom, Sibley, *Bush*, no. 4176. North Dakota: swamps, Leeds, August 7, 1899, *J. Lunell;* Fort Pembina, 1876, *Havard*. South Dakota: vicinity of Brookings, July 12, 1891, *Williams*. Nebraska: 3 miles northeast of Whitman, in dry lake, *Rydberg*, no. 1613; Kennedy, August 20, 1910, *Bates*. Oklahoma: Perkins, Payne Co., August 28, 1895, *J. W. Blankinship;* edge of pond, Copan, Washington Co., *Stevens*, no. 2104; Arkansas River, Creek Nation, August 22, 1895, *J. H. Kimmons*. Texas: *Wright*. Mexico: Oaxaca, *Deam*, no. 16; Toluca, *Holway*, no. 3173.

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BIDENS HYPERBOREA AND ITS VARIETIES.

Norman C. Fassett.

Similar to *Bidens Eatoni* Fernald in its habitat, but more northern in its range, is *B. hyperborea* Greene. This species is confined to estuaries from James Bay to northeastern Massachusetts. *B. Eatoni* has been found only on the mouths of the larger rivers: the Hudson, the Quinnipiac, the Taunton, the Merrimac, and the Kennebec with its near neighbor the Sheepscot. *B. hyperborea*, on the other hand, is to be expected on the tidal shores of almost every fair-sized stream from the Merrimac to the St. Lawrence River, except in the Bay of Fundy and on the Atlantic coast of Nova Scotia.

Bidens hyperborea belongs to a group of three species which are characterized by having simple leaves and achenes with a convex cartilaginous summit. The characters pointed out by Professor Fernald in Rhodora xxiv. 206 (1922), differentiating this species

from *B. laevis* and *B. cernua,* prove, when applied to subsequent collections, to be constant, with one exception. *B. hyperborea* is described as having the disk-corollas 4-toothed; 4- and 5-toothed corollas may be found in one head.

Comparatively few botanists have collected this species, and a complete knowledge of all of its phases cannot be gained until fuller collections have been made. With the exception of a few specimens taken on the estuary of the Miramichi River, by Professors M. L. Fernald and A. S. Pease, the only material from New Brunswick available to the writer was collected by Mr. H. K. Svenson and himself in August, 1923, which was too early for mature plants. The New Brunswick plant is here tentatively referred to the same variety which is found on the St. Lawrence River estuary; future collections may demonstrate the incorrectness of this disposition. Some of the plants collected on the St. Lawrence estuary by Svenson & Fassett appear different from those collected by Brother Victorin the previous year, but for the present these plants are all treated as one variety.

Bidens hyperborea breaks up into the following varieties:

a. Outer achenes 4–5 mm. long; the inner 5–7 mm. long, with marginal awns 1.8–3 mm. long *b*
- *b.* Plant simple and monocephalous: leaves oblanceolate and blunt, entire or obscurely toothed .... var. *typica.*
- *b.* Stem somewhat branching: leaves distinctly serrate .... var. *colpophila.*

a. Outer achenes 6–8.5 mm. long; the inner 7.5–10 mm. long, with marginal awns 3–5 mm. long *c*
- *c.* Branches ascending, making an angle with the stem of less than 45° *d*
  - *d.* Outer involucral bracts mostly linear, acute, rarely exceeding 2 mm. in width: leaves narrowly lanceolate, long attenuate, with 2–8 pairs of fine teeth seldom more than 0.5 mm. broad at base .... var. *cathancensis.*
  - *d.* Outer involucral bracts lanceolate, rarely linear, often obtuse, exceeding 2 mm. in width: leaves lanceolate, not very attenuate, with 1–5 pairs of coarse teeth 1 mm. or more broad at base .... var. *laurentiana.*
- *c.* Branches spreading, making an angle with the stem of more than 45° *e*
  - *e.* Primary leaves with 0–3 pairs of teeth *f*
    - *f.* Leaves thin, with (1–)2–3 pairs of teeth: outer involucral bracts with 1, rarely 2, pairs of teeth; inner bracts broadly oblong, 3–4 mm. wide ...... var. *Svensoni.*
    - *f.* Leaves fleshy, with 0–2 pairs of teeth: outer involucral bracts entire or rarely with 1 pair of teeth; inner bracts narrowly oblong, 2–3 mm. wide .... var. *gaspensis.*
  - *e.* Primary leaves with 4–6 pairs of teeth .... var. *arcuans.*

B. HYPERBOREA, var. **typica.** *B. hyberborea* Greene, Pittonia iv. 257 (1901). Known only from the original collection at Rupert House, James Bay, September 5, 1885, *J. M. Macoun,* no. 12056.

This, the only estuarine plant known from a river entering Hudson Bay, may indicate that many species having affinities with the more southern estuaries should be sought in this region.

B. HYPERBOREA, var. COLPOPHILA (Fernald & St. John) Fernald, RHODORA xx. 149 (1918). Estuaries from Northumberland Strait to northern Massachusetts. This is the most wide-spread of the known varieties of *B. hyperborea*, and shows many local variations in shape of involucral bracts, number of awns, toothing of leaves, and habit.—NEW BRUNSWICK: tidal mud of the Buctouche River, Coate Mills, August 20, 1923, *Svenson & Fassett*, no. 879; tidal shores, Shediac River, Shediac, August 23, 1924, *N. C. Fassett*, no. 2115. NOVA SCOTIA: tidal mudflats of River Philip, Oxford, August 24, 1924, *N. C. Fassett*, no. 2103. MAINE: tidal shores of Pleasant River, Columbia Falls, August 17, 1924, *N. C. Fassett*, nos. 2107 and 2109; Columbia Falls, August 20, 1924, *N. C. Fassett*, nos. 2102 and 2108; Columbia Falls, August 23, 1923, *Svenson & Fassett*, nos. 797 and 847; tidal shores of the Narraguagus River, Cherryfield, August 28, 1923, *Svenson & Fassett*, no. 878; Cherryfield, August 17, 1924, *N. C. Fassett*, no. 2131; tidal shores of the Harrington River, Harrington, August 17, 1924, *N. C. Fassett;* tidal shores of the Union River, Ellsworth, August 29, 1923, *Svenson & Fassett*, no. 848; Ellsworth, August 17, 1924, *N. C. Fassett*, nos. 2111 and 2112; tidal mudflats of the Penobscot River, Bangor, September 7, 1916, *Fernald & Long*, nos. 14829 and 14830; very abundant on muddy and gravelly tidal flats of the Penobscot River, Hampden, September 8, 1916, *Fernald & Long* in *Pl. Exsicc. Gray.* no. 296; tidal mudflats at mouth of Souadabscook Stream, Hampden, September 11, 1916, *Fernald & Long*, nos. 14833 and 14834; tidal mudflats at the mouth of Reed Brook, Hampden, September 8, 1916, *Fernald & Long*, nos. 14831 and 14832; tidal flats of the Sheepscot River, Alna, August 14, 1922, *N. C. Fassett*, no. 292; borders of salt marsh, Back River Creek, Woolwich September 15, 1915, *Fernald & Long*, no. 14826; above tide-limit at edge of marsh and among sedges and rushes of salt marsh, Winnegance Creek, Phippsburg, August 23, 1909, *M. L. Fernald*, nos. 2248 and 2249 (TYPE in Herb. New England Bot. Club); stony beach, tidal shores of the Kennebec River, Gardiner, September 18, 1923, *N. C. Fassett*, no. 884; tidal shores of the Kennebec River, West Woolwich, September 8, 1924, *N. C. Fassett*, no. 2106; tidal shores of the Kennebec River, Richmond Campground, September 16, 1924, *N. C. Fassett*, no. 2129; Cow Island, Topsham, August, 1910, *Kate Furbish;* bank of Androscoggin River, Brunswick, August 13, 1911, *C. H. Bissell;* Brunswick, August 22, 1911, *R. A. Ware*, no. 4230; tidal shores of the Mousam River, Kennebunk, September 22, 1923, *N. C. Fassett*, no. 895; Kennebunk, August 15, 1924, *N. C. Fassett*, no. 2114. NEW HAMPSHIRE: tidal shores of the Salmon Falls River, Salmon Falls, September 22, 1923, *N. C. Fassett*, no. 794. MASSACHUSETTS: brackish muddy shore [of Merrimac River], Newburyport, October 2,

1902, *Eaton & Fernald;* tidal shores, Mill Creek, Rowley, September 22, 1923, *N. C. Fassett,* no. 789; Rowley, August 15, 1924, *N. C. Fassett,* no. 2113.

B. HYPERBOREA, var. CATHANCENSIS Fernald, l. c. Estuary of the Kennebec River, and other rivers of this estuarine system.—MAINE: tidal mudflats of Cathance River, Bowdoinham, September 14 and 19, 1916, *Fernald & Long,* nos. 14825, 14827 (TYPE in Gray Herb.), 14828, also in *Pl. Exsicc. Gray.* no. 295; tidal shores, mouth of West Branch, Bowdoinham, August, 1921, *N. C. Fassett,* no. 911; tidal shores of Merrymeeting Bay, Bowdoinham, August 23, 1921, *N. C. Fassett,* no. 910; tidal shores of the Kennebec River, East Bowdoinham, August 24, 1921, *N. C. Fassett,* no. 160; tidal shores at the mouth of Eastern River, Dresden, September 13, 1924, *N. C. Fassett,* no. 2121; tidal shores, Kennebec River, Hatch's Corner, Dresden, September 9, 1924, *N. C. Fassett,* no. 2117.

B. HYPERBOREA, var. **laurentiana**, n. var., planta 1–3 dm. alta subsimplex ramis ascendentibus supra vel ramis tenuibus infra; foliis lanceolatis non attenuatis primariis 3–11 cm. longis, dentibus utrinque 1–5 obtusis plerumque grossis; bracteis involucri exterioribus 3–6 lanceolatis obtusis 1–3.5(–4.5) cm. longis 1.5–5(–8) mm. latis, plerumque integris rare dentibus utrinque 1–2; achaeniis exterioribus 7–8 mm. longis, interioribus 8–10 mm. longis aristis marginalibus 3.5–4 mm. longis.

Plant 1–3 dm. tall, subsimple, with ascending branches above, sometimes with weak ascending branches below: leaves of the primary stem 3–11 cm. long, ascending, lanceolate, not attenuate, with 1–3 pairs of blunt, usually coarse, teeth: outer involucral bracts 3–6, lanceolate, obtuse at tip, 1–3.5(–4.5) cm. long, 1.5–5(–8) mm. broad, usually entire, the largest rarely with 1–2 pairs of teeth: outer achenes 7–8 mm. long; inner achenes 8–10 mm. long; awns 4, the outer pair 3.5–4 mm. long.—Estuary of the St. Lawrence River, and perhaps on estuaries from Chaleur Bay to Northumberland Strait, New Brunswick.—QUEBEC: Cap-Rouge, un peu plus haut que le Pont de Québec. Rivages sur la zone intercotidale, avec Gentiana Victorinii, 29 août 1922, *Fr. M.-Victorin,* no. 15461 (TYPE in Gray Herb.); grèves de Beauport, près de Québec. Sur la zone intercotidale, 6 août 1922, *Fr. Rolland,* no. 15460; Saint-François de l'Isle d'Orléans, rivages, sur la zone intercotidale, 24 août 1922, *Fr. M.-Victorin,* no. 15459; tidal flats of the St. Lawrence River, St. Jean-Port-Joli, August 10, 1923, *Svenson & Fassett,* no. 912; muddy tidal shore of the Boyer River, St. Vallier, August 9, 1923, *Svenson & Fassett,* no. 855.—The following collections are mostly immature, but seem best treated with this variety. QUEBEC: brackish shore, submerged at high tide, alluvial islands at the mouth of the Bonaventure River, August 4, 1904, *Collins, Fernald & Pease;* dead waters, between Baldé and the Baie des Chaleurs, August 5, 6 and 8, 1904, *Collins, Fernald & Pease,* no. 5871. NEW BRUNSWICK: tidal flats of the Restigouche

River, Head of Tide, August 16, 1923, *Svenson & Fassett*, nos. 893, 897 and 898; tidal shores of Eel River, Dalhousie, August 16, 1923, *Svenson & Fassett*, no. 882; estuary of the Jacquet River, Durham, August 17, 1923, *Svenson & Fassett*, no. 819; tidal flats of the Tetagouche River, Bathurst, August 17, 1923, *Svenson & Fassett*, no. 887; tidal shores of the Tabusintac River, Almwick, August 18, 1923, *Svenson & Fassett*, no. 883; tidal shores of the Miramichi River, Newcastle, August 19, 1923, *Svenson & Fassett*, no. 896; tidal flats of the Miramichi River 5 miles above Newcastle, August 19, 1923, *Svenson & Fassett*, no. 846; tidal flats of the Kouchibouguac River, Charleton, August 20, 1923, *Svenson & Fassett*, no. 888; tidal shores of the Kouchibouguacis River, Bretagne, August 20, 1923, *Svenson & Fassett*, no. 886.

B. hyperborea, var. **Svensoni**, n. var., planta 1–2.5 dm. alta ramis imis arcuato-ascendentibus var. *gaspensem* simulans vel subsimplex; foliis extendentibus ascendentibusve obtusis, dentibus utrinque 1–3 grossis obtusis; bracteis involucri exterioribus (2–)3–4, lanceolatis obtusis utrinque cum dentibus obtusis 1, rare 2 instructis; bracteis interioribus 7–9 mm. longis ad apicem subrotundis; achaeniis exterioribus 6 mm. longis, interioribus 8 mm. longis, aristis marginalibus 2.5–3 mm. longis.

Plant 1–2.5 dm. tall, with arcuate lower branches as in var. *gaspensis* or sometimes subsimple: leaves of the primary stem 4–6 cm. long, spreading or ascending, blunt at tip, with 1–3 pairs of coarse teeth: outer involucral bracts (2–)3–4, lanceolate, obtuse at tip, with 1, rarely 2, pairs of teeth; inner bracts 7–9 mm. long, somewhat rounded at the tip: outer achenes 6 mm. long; inner achenes 8 mm. long; awns 4, the outer pair 2.5–3 mm. long.—Quebec: tidal shores, Rimouski River, Rimouski, August 14, 1923, *Svenson & Fassett*, nos. 936 (type in Gray Herb.) and 899.

Intermediate between varieties *gaspensis* and *laurentiana*. The former it approaches in its usually much branched habit, but differs in the texture and toothing of the leaves and outer involucral bracts. In these it approaches, but does not simulate, var. *laurentiana*.

Named for Mr. H. K. Svenson, whose good companionship and persistence in the face of trying circumstances did much to make the collecting trip of 1923 a successful one.

B. hyperborea, var. gaspensis Fernald, Rhodora xx. 150 (1918). Quebec: brackish shores, submerged at high tide, mouth of the St. John River, Douglastown, August 23, 1904, *Collins, Fernald & Pease;* submerged at high tide, brackish shores about the mouth of Dartmouth River, August 26 and 27, 1904, *Collins, Fernald & Pease*.

B. hyperborea, var. arcuans Fernald, Rhodora xxv. 44 (1923). Known from only one collection, in New Brunswick, tidal mud of the Miramichi River, Newcastle, July 30, 1922, *Fernald & Pease*, no. 25321. Svenson and Fassett, collecting on the estuary of the Miramichi River the year after this variety had been discovered,

found no specimens matching those collected by Fernald and Pease. The latter two collected farther down the river than did the former, hence in more brackish water, so it may be that this variety is more tolerant of salinity than is var. *laurentiana*. Var. *arcuans* must be earlier in its flowering than is var. *laurentiana*, for satisfactory fruiting material of the latter can hardly be found in the middle of August, while the former, collected on July 30, had some mature achenes in the heads.

Bidens **cernua × hyperborea**, var. **colpophila**, hyb. nov., planta 1.5–3 dm. alta subsimplex vel cum ramis tenuibus infra munitis; foliis primariis 5–8 cm. longis extendentibus subascendentibusve attenuatis, dentibus acutis utrinque 1–6; capitulis campanulatis vel hemisphaericis ad anthesem erectis; bracteis involucri exterioribus 4–5, extendentibus vel ascendentibus 1–2 cm. longis; achaeniis curvatis in costis prominentibus marginibus suberosis substriatulis.

Plant 1.5–3 dm. tall, subsimple or with weak branches below: leaves of the primary stem 5–8 cm. long, spreading or subascending, attenuate, with 1–6 pairs of sharp teeth: heads campanulate to hemispherical, erect in anthesis; outer involucral bracts 4–5, spreading to ascending, 1–2 cm. long: achenes curved, with prominent midribs and corky margins, obscurely striate.—With the habit of *B. hyperborea*, and the achenes of *B. cernua*.—Maine: Nonesuch River, Scarborough, September 25, 1924, *Norton, Welden & Haven* (type in Gray Herb.); Nonesuch River, Scarborough, August 20, 1919, *A. H. Norton.*

Graduate School of Arts and Sciences, *Harvard University.*

Erysimum **Pallasii** (Pursh), n. comb.—*Cheiranthus Pallasii* Pursh, Fl. Am. Sept. ii. 436 (1814). *C. pygmaeus* Adams, Mém. Soc. Nat. Mosc. v. 114 (1817). *Hesperis pygmaea* (Pursh) Hook. Fl. Bor.-Am. i. 60, t. 90 (1830). *H. minima* T. & G. Fl. N. A. i. 90 (1838). *H. Hookeri* Ledeb. Fl. Ross. i. 174 (1841). *Erysimum pygmaeum* (Adams) Gay, Erys. Nov. 4 (1842). *Hesp. Pallasii* (Pursh) Seem. Bot. Herald, 24 (1852). *Sisymbrium pygmaeum* (Pursh) Trautv. Act. Hort. Petrop. i. 60 (1871).

This beautiful purple-flowered arctic species has recently been known as *Erysimum pygmaeum* or by those who merge it with *Hesperis* as *H. Pallasii*. The latter combination is generally ascribed to Torrey & Gray, who certainly did not make it. They called it *Hesperis minima*, but added the note: "Sir William Hooker is inclined to refer to this species Cheiranthus Pallassii, *Pursh*, . . . If his suspicion is confirmed, Pursh's specific name must be adopted."—M. L. Fernald, Gray Herbarium.

Mark Alfred Carleton died April 26, 1925, in Paita, Peru, from an attack of malaria. He was born near Jerusalem, Ohio, March 7, 1866. For several years, subsequent to March 1894, Carleton was in the service of the United States Department of Agriculture. In this capacity he gave special attention to cereal diseases and established the physiological relationships of nearly all the cereal rusts of this country. He visited in 1898 and 1899 Russia and Siberia in search of rust-resisting and drought-resisting cereals, and he introduced to this country many Eurasian cereals which have proved highly advantageous to American agriculture. Among European scientists Carleton was the most widely recognized American phytopathologist. His death is a great loss to science.—Theo. Holm, Clinton, Maryland.

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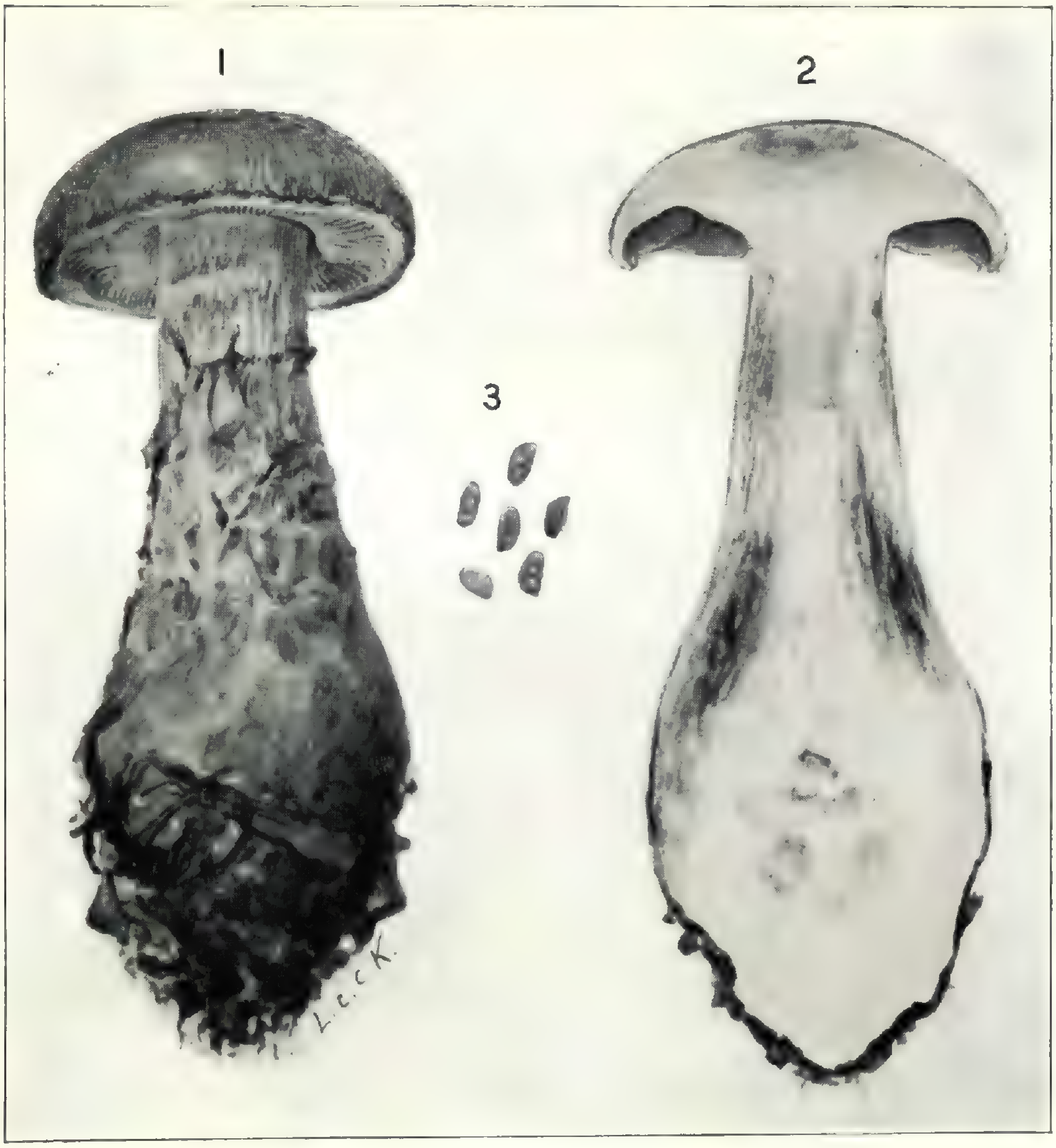

Cortinarius cyanites (from a painting).

Cortinarius cyanites (from a photograph).

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 27. October, 1925. No. 322.

POLYGONUM PENSYLVANICUM AND RELATED SPECIES.

E. E. Stanford.

The early history of the characteristic North American *Polygonum pensylvanicum* L. is not marked by complications. *P. Careyi* Olney, which may be considered its closest relative in the northern part of its range, is set off sharply by its hirsute character and thick-lenticular achene. From the introduced *P. Persicaria*, *P. pensylvanicum* is easily differentiated by its larger habit, the brighter green of its foliage and the clear pink of its larger panicles. The variations of *P. pensylvanicum* in the northern and central portion of its range have been elucidated by Fernald.[1] In the present paper a southern plant, in which the glandular hairs which clothe the upper portions of the previously proposed varieties are replaced by a rather copious strigosity, is proposed as a new variety. Western specimens of *P. pensylvanicum* var. *laevigatum* often show a considerable reduction or even entire loss of the hairy indument, but this is here mentioned as a phenomenon requiring further study before these extremes can be assigned definite systematic rank. Under *P. pensylvanicum* var. *laevigatum* is proposed, as a forma, a rather pallid plant whose glands, strongly reddened in the type, are lacking in pigment and are yellowish.

In the more southerly portions of the range of *P. pensylvanicum*, and particularly south of the continental limits of the United States, occur several closely related plants, the assignment of which to specific or varietal rank is of greater difficulty.

P. segetum HBK. described from "*alta planitie Andium Novogranatensium prope Santa Fé de Bogota in agris humidis inter segete , alt.*

[1] Fernald, *The Variations of Polygonum pensylvanicum*, Rhodora, xix. 70–73 (1917).

1365 hex.," is a close southern analogue of *P. pensylvanicum.* Meisner,[1] in comparing it with the latter, states:

"Nimis affine P. Pennsylvanico, recedens tantum spicis gracilioribus et calyce eglanduloso, fructifero dimidio minore et magis ovato."

The calyx of *P. pensylvanicum* is hardly glandular; the differentiation is good in other respects. Small[2] brought out the difference between the pointed achene of *P. segetum* and the nearly orbicular and larger one of *P. pensylvanicum;* his achene-drawings, however, slightly exaggerate the difference in character and are not on the same scale, indicating a reverse relation as to sizes. His habit-sketch also exaggerates the ciliation of the leaves, which is not sufficient to separate *P. segetum* from *P. pensylvanicum* var. *genuinum* Fernald. The most obvious differences are the greater proportionate length of the leaves of *P. segetum* and their tendency to elongate attenuation, especially at the apical end.

Meisner noted three varieties of *P. segetum:* "α. *genuinum,* staminibus inclusis, calycem aequantibus . . . . β. *stamineum,* staminibus exsertis, stylos aequantibus vel superantibus . . . γ. *Lindenii,* staminibus calyce brevioribus, bracteis subacuminatis . . ."[3]

This would indicate heterostyly. Examination of material cited by Meisner for α. *genuinum* (Colombia, *Funke & Schlim,* no. 250) and for β. *stamineum* (Cuba, *Ramon de la Sagra,* no. 187) indicate no greater heterostyl tendency than is often seen in *P. pensylvanicum.* The Cuban specimen is fully fruitful and is in that respect not comparable with the staminate form of *P. longistylum* Small, which is usually of reduced fertility.

The region cited for γ. *Lindenii* (Mexico; *Linden,* no. 107, type not seen by me) and the subacuminate bracts (as contrasted with the "bracteis acutiusculis" of the type) indicate a close affinity with P. *mexicanum* Small, in which the heterostyl tendency is more marked.

P. ludovicianum Meisn.[4] was reduced by Small[5] on the ground that "The only distinctive character given is simply pubescent peduncles and pedicels in place of glandular ones. The diagnosis is incorrect, however, as some glands do exist on the original specimen." The

[1] Meisner, in DC. Prodr. xiv. 120 (1856).
[2] Small, Mon, N. A. Polygon. 72 (1895).
[3] Meisner, l. c. 121 (1856).
[4] Meisner, l. c. 116 (1856).
[5] Small, *A Preliminary List of American Species of Polygonum,* Bull. Torr. Bot. Cl. xix. 353 (1892).

material seen does not indicate the reestablishment of any of these latter titles of the plant to specific rank.

A Guatemalan plant, allied to *P. segetum* by achene- and habit-characters, but separated by glandularity of stem and harshness of leaf, is proposed in this paper as a new variety of *P. segetum.*

P. mexicanum Small[1] is best defined by its narrow lanceolate foliage and gibbous-concave and dull achene. The tendency to diversity in length of style and stamens noticeable in *P. pensylvanicum* is more evident in the Mexican plant, but the segregate heterostyly of *P. longistylum* seems to be lacking. The plant appears to be a coarse, or sometimes wiry, annual; certain evidently perennial and almost shrubby heterostyled types distributed under this name are proposed in this paper as a new species and variety.

P. longistylum Small[2] is a reduced counterpart of *P. pensylvanicum* in which the heterostyl habit has become established and segregated, as noted by Robinson.[3] Short-styled flowers often lack fertility, but sterility is not so general as in short-styled flowers of the amphibious group. The achenes are smaller than those of *P. pensylvanicum,* more lustrous, and usually with a pronounced gibbosity on one side; generally sharp, they usually lack the elongate point shown in the drawing of Small's Monograph. Those of the long-styled flowers approach that extreme more closely than do the less common ones of the short-styled. The species in the main seems well set off, though in some portions of its range occur forms uncomfortably close to *P. pensylvanicum* var. *laevigatum.*

Nieuwland[4] sought to identify *P. longistylum* with the problematical *P. bicorne* Raf.[5] Nieuwland states: " . . . one can scarcely hesitate in believing that this author, or Robin from whom he may have gotten an original description, had in mind or more likely at hand, an abnormally large specimen of *Polygonum longistylum* Small . . . the 'elongated exserted styles' . . . are unique for this plant, and found in no other American *Persicaria.* The locality is . . . the same."

[1] Small, l. c. 356 (1892).

[2] Small, *New and interesting Species of Polygonum*, Bull. Torr. Bot. Cl. xxi. 169 (1894).

[3] Robinson, *Notes on some Polygonums of western North America*, Proc. Bost. Soc. Nat. Hist. xxxi. 265 (1904).

[4] Nieuwland, *Polygonum longistylum Small, a Synonym.* Am. Midl. Nat. iii. 200 (1914).

[5] Raf. Fl. Ludov. 29 (1817).

In judging what an author has in mind, particularly in the case of a translation, it is sometimes illuminating to compare the translation with the original and also to review somewhat the circumstances under which the translation was made. Rafinesque's original was the "Flore Louisianaise" of Robin (1807), which was a portion of a several volume account of this writer's travels in that part of the world. To quote from Robin's "Discours Préliminaire" his descriptions were prepared "*sur les lieux, au milieu des bois et des prairies, et toujours en présence de l'objet que je décrivais . . .* "; a model method, yet one that prepared no material for the information of subsequent botanists. Robin followed the system of de Jussieu; he was acquainted with that general scheme of classification but he made (in this case at least) no note of specific names and his descriptions, in some cases at least, are rather vague. The following is the pertinent portion of his notes regarding the plant named by Rafinesque *P. bicorne*, with some notes as to other species:

"*Renouées* (poligonum). *Persicaires*, vulg. *Curages*. Il se trouve ici plusieurs de ces espèces . . . elles s'élèvent de quarte à cinq pieds . . . .

Toutes ont à-peu-près le même feuillage, pétiolé alongé, terminé en pointe . . . La plus commune et la plus belle jette de nombreux rameaux alternes, çà et là, à demi-couchés, genouillés, considérablement arrondis, . . . se colorant de pourpre. Chaque branch, chaque brandille portent un épis de fleurs couleur rose, très-touffu, long de deux à trois pouces; les corolles de ces fleurs ont huit étamines; un pistil bicorne s'élève au-dessous des étamines et de la corolle."

It is fairly clear from the autobiography of Rafinesque and also from the accounts of his life by Call and Fitzpatrick that at the time of the appearance of the Florula Ludoviciana the translator had never visited Louisiana, had no special knowledge of its flora, and no specimens with which to compare the descriptions of Robin. To quote briefly from Rafinesque's "Preamble"

"In perusing this Flora, I was astonished to find, among many blunders in nomenclature and classification, several accurate descriptions and valuable additions to the knowledge of plants . . . Having, . . . compared . . . his descriptions with the Floras of . . . Michaux and Pursh, I became convinced that a great number of new genera and species . . . were described by Robin . . . .

I have undertaken this task . . . an arduous one, owing to the numerous misnames and errors of the author . . . .

The result of this labour consists in the enumeration of more than 400 species, whereof 196 are new . . . "

Rafinesque's version of "*P. bicorne*" is more accurate, except in one and that a rather pertinent particular, than one might expect from an examination of certain other portions of the book. It is also quoted more fully by Nieuwland.

"Caulibus ramosis, ramis geniculatis, patulis teretibus intus crenulatis; foliis petiolatis, lanceolatis, glabris; floribus spicatis confertis octrandis, distylis, staminis inclusis, stylis exsertis elongatis. Raf.—Renouée i. Rob. p. 366. Large plant, four or five feet high, branches purplish, every one of which bears a fine thick spike, about three inches long, of rose colored flowers . . . ."

To one who has examined any considerable number of the species of *Polygonum* which characterize the southern United States it will be rather evident that "un pistil bicorne . . . audessus des étamines et de la corolle" is often found in *P. pensylvanicum* itself (to which the *Index Kewensis* refers *P. bicorne*), *P. mexicanum*, *P. segetum*, and the rather large *P. densiflorum* Meisn., none of which are out of the question in the locality of *P. bicorne*. The "elongation" which would seem to refer particularly to *P. longistylum* is the work of Rafinesque, writing in the neighborhood of New York, and not of Robin in Louisiana. *P. longistylum*, although seemingly of too low habit, may of course have been meant. But to quote from Rafinesque's own title page: "*Quand les matériaux sont imparfaits, l'édifice ne peut pas être complet.*"

Greene[1] described *Polygonum omissum:* " . . . whole stem as well as branches and peduncles rough with rather sparse stipitate glands, but foliage glabrous even to margin . . . styles exserted . . . .

Greeley, Colorado, 20th September, 1872. It is no rarity there and elsewhere along the Platte River, and has long been allowed to pass for *P. Pennsylvanicum.*"

From this description, and from a specimen collected by Greene in the type locality (the date on the label is not clear, but looks like Sept. 10, 1872) this should be a variety of *P. longistylum.*

The plants discussed above, with the exception of *P. segetum* and *P. longistylum*, are described as annuals, and the material seen would confirm the description. Most specimens of *P. longistylum* seen are first-year plants, and none can be listed as perennial with any degree

[1] Greene, *New Species of Polygonum*, Pittonia, v. 200 (1903).

of certainty. Under *P. mexicanum* there have been distributed from the Gulf States certain specimens which are evidently perennial and have an almost shrubby basal habit. A perennial species, of this shrubby type, also characterized by strigose rather than glandular-hairy peduncles, peculiarly acuminate ocreolae, heterostyl habit and small, dull, narrowly oval achene is here proposed as new. A variety of this species, representing in some respects a median form between the type and *P. longistylum*, is likewise proposed as new.

Key to Polygonum pensylvanicum and related species.[1]

Plants annual or perennial, mostly upright; stems glabrous below (in one variety glandular); upper branches and peduncle clothed with spreading glandular or rarely appressed and simple hairs; panicles mostly dense: achenes lenticular.

a. Flowers with some tendency to heterostyly, but the types not segregated on separate plants *b*.
- *b.* Achenes nearly orbicular, both the sides usually flattened or concave *c*.
  - *c.* Leaves evidently strigose: achenes 2.2–2.8 mm. broad.
    - Peduncle covered with spreading glandular hairs 1a. *P. pensylvanicum* var. *genuinum*.
    - Peduncle covered mostly with simple appressed hairs. 1d. *P. pensylvanicum* var. *durum*.
  - *c.* Leaves glabrous or glabrescent: achenes 2.5–3.5 mm. wide *d*.
    - *d.* Stems erect: leaves lanceolate, acuminate: stamens 7–8.
      - Glands of hairs red....1b. *P. pensylvanicum* var. *laevigatum*.
      - Glands of hairs without pigment 1c. *P. pensylvanicum* var. *laevigatum f. pallescens*.
    - *d.* Stems depressed or subascending: leaves elliptic to oval, obtuse: stamens 5–6..1e. *P. pensylvanicum* var. *nesophilum*.
- *b.* Achenes ovate; at least one side convexed or gibbous, dull *c*.
  - *c.* Leaves long-attenuate, minutely strigose *d*.
    - *d.* Stems glabrous below: margin of leaf ciliate but not harsh..2. *P. segetum*.
    - *d.* Stems glandular below: margin of leaf harsh with sharp bristles..................2a. *P. segetum* var. *verrucosum*.
  - *c.* Leaves narrow-lanceolate, glabrous or glabrescent..3. *P. mexicanum*.

a. Flowers definitely heterostyled; the types segregated on different plants *e*.
- *e.* Annual or slightly woody perennial: leaves lanceolate, acuminate: achene 2–2.5 mm. wide, shining *f*.
  - *f.* Peduncles and upper stems only clothed with glandular hairs..*P. longistylum*.
  - *f.* Major portion of the stem as well as branches clothed with glandular hairs............4a. *P. longistylum* var. *omissum*.
- *e.* Perennial with woody base: leaves narrow-lanceolate: achene 1.5–1.7 mm. wide, dull.
  - Ocreolae elongate-acuminate: peduncles more or less strigose with appressed hairs..............5. *P. mississippiense*.
  - Ocreolae short-acuminate: peduncles with more or less abortive glandular hairs......5a. *P. mississippiense* var. *interius*.

[1] Unless otherwise stated, the specimens cited are in the Gray Herbarium.

1a. Polygonum pensylvanicum var. genuinum Fernald, Rhodora xix. 70 (1917). Annual: stem 3–12 dm. high, woody below and rather stout, erect and usually much branched, glabrous below, clothed more or less with glandular hairs above, green, reddish, or brownish; nodes somewhat swollen, especially below, often dark-ringed; longer internodes 3–4 cm. long: leaves lanceolate or inequilaterally lanceolate, 1–3.5 cm. wide, 5–20 cm. long, herbaceous, rather sparsely and finely strigose, especially on the veins above, lighter green and more profusely strigose beneath, copiously but usually inconspicuously dotted with internal glands (these in some cases becoming darkened and very apparent), cuneate-rounded at base, long-attenuate to a somewhat flexuous tip, entire; the margin slightly revolute, clothed with minute forward-appressed bristles; petioles 0.5–2 cm. long, attached at the base of the ocrea: ocreae 1–1.5 cm. long, thin-scarious, close cylindric above and becoming looser, disintegrating, and finally disappearing below; at least the upper fine-strigose and often scatteringly clothed with glandular hairs; margin entire or sometimes with inconspicuous bristles: inflorescence much branched: peduncles copiously clothed with glandular hairs 0.25 mm. long; the prominent terminal glands conspicuously reddened: panicles 2–5 cm. long: ocreolae and fascicles much crowded, hiding the axis: ocreolae 3 mm. long, oblique, very obliquely truncate to an acute apex, greenish or rather scarious, often with somewhat hyaline margins; the lower often clothed with glandular hairs; margin with sparse short bristles or more rarely naked: fascicles many-flowered: the bracts brown-scarious and persistent: pedicels 2–3 mm. long, scarcely exceeding the ocreola: flowers mostly perfect and cleistogamous with rather scant pollen: fascicles usually including one or more flowers of the pronouncedly staminate type with abundant (usually normal) pollen; in some plants a pronounced tendency toward heterostyly noticeable: calyx pink, deep-rose or light purple, ovoid-oblong, 3–4 mm. long, 5-parted to below the middle, with rounded lobes; in fruit accrescent, closely fitting the lenticular achene; the sterile flowers smaller: stamens 8 (occasionally 6 or 7), alternating on the base of the calyx with glandular nectaries; filaments usually sub-equal to the calyx-lobes, becoming shorter or somewhat exserted in certain types: style 1.5–2.5 mm. long, 2-cleft to below the middle, the branches usually equalling the calyx-lobes, or shorter or considerably exserted in some instances, in fruit reflexed or recurved and usually contained in but sometimes exserted from the closed accrescent calyx; stigmas capitate or somewhat clavate: achene lenticular, ovoid-pointed 2.2–2.8 mm. wide, 3–3.5 mm. long, usually flattened on one side and somewhat concaved on the other, rather shining.—*P. pensylvanicum* L. Sp. Pl. 362 (1753). *Persicaria pensylvanica* (L.) Small, Fl. S. E. U. S. 377 (1903). Coastal plain from Massachusetts to Mississippi, northward through the Mississippi basin to southern Ontario. Specimens cited by Fernald, l. c.

1b. Var. LAEVIGATUM Fernald, l. c. More glabrous as to leaves, ocreae, and ocreolae: flowers usually paler: pedicels longer-exserted: achenes broader (3–3.5 mm.).—The common interior plant passing as *P. pensylvanicum*, from New Brunswick to South Dakota, Colorado, and southward.

1c. Var. LAEVIGATUM, forma **pallescens**, forma nov., planta pallidiora; glandibus flavis. VERMONT: streets, Brattleboro, *Robinson*, no. 143 (TYPE in Gray Herb.). MASSACHUSETTS: Granville, Hampden Co., *Seymour*, no. 71. NEW YORK: Buffalo, "White, constant in color," *Clinton*. PENNSYLVANIA: Sandy Ridge, Chester Co., *I. W. Anderson*, August 13, 1915. The glands recall those of *P. scabrum* Moench, but their structure is typical of this species.

1d. Var. **durum**, var. nov., ab var. genuino recedens pilis pedunculorum plerumque appressis non glandulosis; staminibus 6.—Coastal; South Carolina to Texas. Type from FLORIDA: river-bottom at Chattahoochee Landing, September 12, 1884, *A. H. Curtiss*. The following are also characteristic. SOUTH CAROLINA: Santee Canal, July, *Ravenel*. ALABAMA: Tensaw, August 18, 1904, *Tracy*, no. 8051. MISSISSIPPI: Agricultural College, Oktibbeha Co., *Pollard*, no. 1301. TEXAS: near Texarkana, Bowie Co., alt. 300 ft., *Heller*, no. 4278.

1e. Var. NESOPHILUM Fernald, RHODORA xix. 70 (1917). Spreading or subascending, dwarfed and reduced: leaves elliptic-oval, glabrous or minutely roughened, with a central dark spot: ocreae much reduced, greenish: ocreolae short-funnelform, mostly hidden by the flowers: panicles short, 1–2 cm. long, short-peduncled or nearly sessile: flowers bright rose: fruiting calyx and achene nearly orbicular: stamens 5–6: styles exserted: pollen defective in the type, but achene-production apparently normal.—Nantucket, Massachusetts and Block Island, Rhode Island, in sand.

2. P. SEGETUM HBK. Nov. Gen. et Sp. ii. 178 (1818). Perennial: stem procumbent (Kunth) or erect, glabrous below, becoming glandular-hairy on the branches above: leaves (upper leaves only seen) narrow-lanceolate or somewhat falcate, 1–2 cm. wide, 10–20 cm. long, attenuate to both ends, glabrous or minutely scabridulous, especially toward the margin, with minute harsh bristles, sessile or narrowed to and somewhat decumbent on a petiole about 1 cm. long, attached to the lower portion of the ocreae: ocreae 1–2 cm. long, thin-scarious and close-cylindric above except at the branching nodes, somewhat swollen at attachment of leaf, truncate, eciliate, and glabrous: inflorescence somewhat branched: peduncles clothed with minute glandular hairs: panicles 2–4 cm. long, rather closely flowered and slender: ocreolae 2.5–3 mm. long, obliquely truncate, firm-scarious; the margins membranous and eciliate: pedicels rather stout, 2–3 mm. long, scarcely exserted: flowers pink, in general characters resembling those of *P. pensylvanicum:* calyx 5-lobed: in fruit 3–3.5 mm. long, ovate: stamens 6–7, included in specimens seen: styles about 1.5 mm. long,

2-parted to below the middle, included or barely exserted in fruit; achene 2.0–2.5 mm. wide, 2.5–2.7 mm. long, lenticular, ovate, rather sharply pointed; the sides slightly convex or one slightly concave, minutely glandular and rather dull.—*P. segetum* HBK., l. c.; Sprengel, Syst. ii. 257 (1825); Meisner, Monog. Gen. Polyg. Prodr. 67 (1826) and in DC. Prodr. xiv. 120 (1856); Small, Monog. N. A. Polyg. 72 (1895). *P. segetum* var. *genuinum* and var. *stamineum* Meisner in DC. Prodr. xiv. 120 (1856). *Persicaria segata* (HBK.) Small, Fl. S. E. U. S. 378 (1903).—Louisiana, New Mexico, Texas and southward to northern South America; also in Cuba. The following are typical. LOUISIANA: June (as *P. mite*, var.) from the S. B. Buckley Herb., in Herb. Mo. Bot. Gard. CUBA: *C. Wright*, no. 2247, in Herb. Mo. Bot. Gard. and Herb. N. Y. Bot. Gard., *Ramon de la Sagra*, no. 187, in Herb. N. Y. Bot. Gard. COLOMBIA: *Funke & Schlim*, no. 250, in Herb. N. Y. Bot. Gard.

2a. Var. **verrucosum**, var. nov., caule glanduloso-verrucoso; foliis scabro-hispidis crenulato-undulatis; floribus achaeniisque majoribus, achaeniis 2.7 mm. latis 3–3.2 mm. longis.—Apparently a larger and coarser plant than the type, but probably better treated as a variety rather than a separate species because of the general similarity in flower and fruit. GUATEMALA: Coban. Alta Verapaz, 1350 meters, April, 1908, *H. von Tuerckheim*, no. II. 1207 (TYPE in Herb. Gray; dupl. in Herb. Mo. Bot. Gard.).

3. P. MEXICANUM Small, Bull. Torr. Bot. Club, xix. 356 (1892). Annual: stem 4–10 dm. tall, erect or sometimes decumbent and rooting at the nodes below, rather coarse, considerably branched, glabrous or slightly glaucous below, greenish or reddened; internodes 4–6 cm. long; nodes barely swollen: leaves narrowly lanceolate, 1–2 cm. wide, 6–12 cm. long, glabrous or minutely scabrid, with slightly revolute margin, eciliate or in older leaves ciliate with short sparse hairs: ocreae 0.5–1.5 cm. long, minutely hairy, mostly eciliate at margin, rather loose and soon disintegrating: inflorescence much branched, the peduncles more or less sparsely glandular-hairy; panicles 3–4 cm. long, rather close-flowered: ocreolae 2–3 mm. long, glandular-roughened or glabrous, rather acute, usually eciliate: pedicels reddened, rather stout, about equalling the ocreolae: flowers light pink to deep rose, more or less heterostyled, but the segregate heterostyly with consequent loss of fertility in short-styled flowers not manifest in specimens seen: calyx 3 mm. becoming 3.5–4 mm. long in fruit, deeply parted; lobes rounded or more or less acute: stamens 6–8, 2–3.5 mm. long, included or somewhat exserted: style 1–3 mm. long, included or exserted: achene 2.5–3 mm. wide, 2.5–3 mm. long, ovate or orbicular, abruptly pointed, usually gibbous on one side and concave on the other, minutely pitted-roughened and rather dull, commonly with exserted styles.—*Polygonum pennsylvanicum* Torr. Bot. Mex. Bound. Surv. 178 (1859); Wats. Proc. Am. Acad. xvii. 147 (1883); not L. *P. mexicanum* Small, l. c. and

Monog. N. A. Polyg. 60 (1895). *Persicaria mexicana* Small, Fl. S. E. U. S. 377 (1903).—Mexico; cited by Small from southern Louisiana and southern Texas; very probably occurs there, but all specimens seen by the writer from north of Mexico which have been referred to *P. mexicanum* belong to *P. mississipiense*, described below. The following are referred to *P. mexicanum*. Mexico: in paludosis prope Morales, 1876, *Schaffner*, no. 882; Durango and vicinity, along water courses, June, 1896, *Palmer*, no. 236; Guadalajara, October 3, 1903, *Holway*, no. 5101: Valley Zapotlan, Jalisco, August 8, 1905, *Goldsmith*, no. 108.

4. P. longistylum Small, Bull. Torr. Bot. Club, xxi. 169 (1894). Annual (or perennial?): stem 3–10 dm. high, rather slender, erect, somewhat branching, glabrous below, becoming more or less sparsely clothed with glandular hairs above, greenish or reddish; the nodes in robust plants conspicuously swollen; internodes 3–6 cm. long: leaves lanceolate, 0.5–2 cm. wide, 3–12 cm. long, herbaceous, dull green, glabrous or nearly so, usually dotted with dark glands beneath, somewhat abruptly cuneate and more or less decurrent on the short petiole, attenuate to tip; margin with minute appressed bristles: ocreae 0.25–1 cm. long, thin-membranous, somewhat spreading and soon torn and disappearing; the upper sparsely ciliate; margin entire or minutely ciliate: bracts thin-membranous, persistent: ocreolae and fascicles somewhat crowded: pedicels slender, 2.5–3 mm. long, strongly exserted, equalling or exceeding the achene: flowers pale pink, definitely heterostyled; the two forms typically occurring on separate plants; the long-styled usually, the short-styled more rarely, producing fruit.

Long-styled form. Calyx 2–2.5 mm. long, in fruit becoming 3–3.5 mm. and sharply ovate, deeply 5-parted: stamens 6–8, included, the anthers polliniferous: style 3–4 mm. long, deeply 2-cleft, much exserted in flower and fruit (in the latter sometimes reflexed or recurved and included: stigmas clavate.

Short-styled form. Calyx 3 mm. long, opening widely and usually not closing if fruit is not formed: stamens 2.5–3.5 mm. long, strongly exserted: style 1–1.5 mm. long, 2-cleft to the middle; stigmas capitate: achene 2–2.5 mm. wide, 2.5–3 mm. long, lenticular, ovate or orbicular-ovate, sharp but not usually with elongate point.—Small, l. c. and Monog. N. A. Polyg. 62 (1895); Robinson, Proc. Bost. Soc. Nat. Hist. xxxi. 265 (1904); Robinson & Fernald in Gray Man. ed. 7. 361 (1908). *Persicaria longistyla* Small, Fl. S. E. U. S. 377 (1903).—Low grounds, Illinois to Louisiana, Texas, and New Mexico. The following are cited as typical. Illinois: waste places, St. Clair Co., *Eggert* (in Herb. Mo. Bot. Gard.). Missouri: Dunklin Co., *Bush*, no. 117A.; wet soil, Carthage, *E. J. Palmer*, no. 1078 (in Herb. Mo. Bot. Gard.). Kansas: low ground, Riley County, *J. B. Norton*, no. 457a; dried-up pond, near Osborn City, *Shear*, no. 210. Oklahoma: Arkansas, *B. F. Bush*, no. 1425 (in Herb. Mo. Bot. Gard.).

TEXAS: Houston, 1842, *Lindheimer;* Lynchburg, 1842, *Lindheimer;* sandy soil, Harrisburg, 1842. *Lindheimer* (in Herb. Mo. Bot. Gard.); Sutherland Springs, Wilson Co., *E. Palmer,* no. 1180. The older specimens (*Lindheimer,* etc.) were distributed as *P. pensylvanicum.*

4a. Var. **omissum** (Greene), n. comb. Differing from the type in that the glandular hairs clothe at least the entire upper portions of the stem as well as the upper branches and peduncles. Long-styled form only seen.—*P. omissum* Greene, Pittonia v. 200 (1903). *Persicaria omissa* Greene. Leaflets i. 24 (1904); Rydberg, Fl. Rocky Mts. 236 (1917).—Colorado and probably southward. The following are cited as typical: COLORADO: Greeley, September 10 (?), 1872, *E. L. Greene.* NEW MEXICO: 1847, *A. Fendler,* no. 759 (?); in Herb. Mo. Bot. Gard., a rather fragmentary specimen which apparently belongs here.

5. P. **mississipiense,** sp. nov., perenne basi subligneum erectum imo glabrum; foliis anguste lanceolatis 0.7–1.2 cm. latis 7–10 cm. longis cuneatis breviter petiolatis longe attenuatis minute strigosis subtus glandulosis; ochreis 0.5–0.7 cm. longis minute strigosis breviter ciliatis; pedunculis strigosis sparse glandulosisque; paniculis densis 3–5 cm. longis erectis; ochreolis 4–5 mm. longis acutis vel acuminatis vel cuspidatis valde obliquis glumiformibus subtus margine breviter ciliatis; fasciculis plurifloris; pedicellis gracilibus vix exsertis; floribus heterostylis in eadem planta floribus omnibus longistylibus vel omnibus brevistylibus. *Flores longistyles* calycibus 3 mm. deinde 3.5–4 mm. longis ovatis; staminibus 6–7 inclusis 2 mm. longis; stylo ad mediam 2-partite valde exserto; stigmatibus clavatis. *Flores brevistyles* calycibus staminibusque 4 mm. longis exsertis; stylo 1.5 mm. longo incluso; stigmatibus capitatis; achaeniis 1.5–1.7 mm. latis 2–2.5 mm. longis lenticularibus ovatis acutis nigrescentibus opacis biconvexis.

Perennial: stem 5–8 dm. high, woody and even shrubby at the base, erect, somewhat branched or nearly simple; the stem proper glabrous or nearly so; the herbaceous portion leafy and with reduced leafy branches at the nodes; internodes 3–7 cm. long: leaves narrowly lanceolate, 0.7–1.2 cm. wide, 7–10 cm. long, minutely strigose with sharp hair-points on both surfaces and dark-glandular below, cuneate and somewhat decurrent on the short petiole, long-attenuate; margins and veins fine-strigose: ocreae 0.5–0.7 cm. long, much reduced and some becoming torn and more or less disappearing, minutely strigose and short-ciliate: inflorescence branched, the peduncles clothed with upward-appressed simple hairs with which a few scattered glandular hairs are intermixed; panicle rather crowded. 3–5 cm. long, upright ocreolae 4–5 mm. long, acute or acuminate or even cuspidate, very oblique, with a glume-like appearance, glabrous below, short-ciliate at margin: fascicles several-flowered; pedicels slender and barely exserted: flowers definitely heterostyled, segregated (or nearly so): on different plants.

Long-styled form. Calyx 3 mm. long, becoming 3.5–4 mm. in

fruit, 5-parted nearly to the base, flattened-ovate: stamens 6–7, 1.5–2.0 mm. long, included, polliniferous: style 2-parted to about the middle, strongly exserted in flower and fruit; stigmas clavate.

Short-styled form. Calyx and stamens 4 mm. long, the latter exserted: style 1.5 mm. long, parted to below the middle, included, not much increased in fruit: stigmas capitate.

Achene 1.5–1.7 mm. wide, 2–2.5 mm. long, lenticular, ovate-pointed, nearly black, rather dull, slightly and evenly convexed on both sides.—Mississippi, near the coast; probably in sand. Mississippi: Long Beach, September 8, 1900, *Tracy & Lloyd*, no. 133 (type in Herb. Gray; duplicate in Herb. Mo. Bot. Gard.); Manuel, *Tracy*, no. 4929 in Herb. Mo. Bot. Gard. Both distributed as *P. mexicanum* (?).

5a. Var. **interius**, var. nov., pedunculis pilis glandulosis plus minusve abortivis sparse munitis; ocreolis acutis.—Oklahoma and Texas. Oklahoma: Huntsville, Kingfisher County, August 23, 1896, *L. A. Blankinship* (type in Herb. Gray; duplicate in Herb. Mo. Bot. Gard.). Texas: Pierce, *Tracy*, no. 7636. Both distributed as *P. mexicanum.*

Western Reserve University.

A KEY TO THE NORTHEASTERN AMERICAN SPECIES OF BIDENS.

Norman C. Fassett.

In attempting to determine the relationships of several species of *Bidens* it has been found helpful to construct a key to all the members of this genus, native and naturalized, which are found from Maryland to the Gulf of St. Lawrence. Since this includes several species not treated in edition 7 of Gray's Manual, it is here presented.

a. Achenes flat, or rhomboidal in cross-section, or with winged keels, not conspicuously narrowed to the summit *b*
- *b.* Achenes cuneate, without winged margins *c*
  - *c.* Awns of firmer texture than the body of the achene, terete or with rounded angles: outer involucral bracts exceeding the disk *d*
    - *d.* Achenes striate: leaves simple, often deeply cleft *e*
      - *e.* Margins of the achenes antrorsely barbed, at least at the very base *f*
        - *f.* Terminal heads with 8–30 flowers *g*
          - *g.* Achenes nearly linear, plano-convex in cross-section, without midribs, copiously pubescent: awns very slender, spreading, at least ½ as long as the body of the achene . . *B. bidentoides* (Nutt.) Britton.
          - *g.* Achenes flat to bi-convex, with conspicuous midribs, sparsely pubescent: awns stouter,

not more than ⅓ as long as the body of the achene *h*

h. Terminal heads 8 mm. or more long . . *B. Eatoni* Fernald.

h. Terminal heads 4–7 mm. long . . . . × *B. multiceps* Fassett.

f. Terminal heads with 30–60 flowers *i*

i. Achenes 4-angled at summit, at least when mature . . . . *B. connata* Muhl.

i. Achenes flat . . *B. heterodoxa* (Fernald) Fernald & St. John.

e. Margins of the achenes retrorsely barbed for the entire length *j*

j. Summit of achenes convex and cartilaginous *k*

k. Heads hemispherical, nodding in anthesis: outer involucral bracts reflexed, spreading, or subascending: achenes rhomboidal in cross-section, finely and obscurely striate, often tuberculate *l*

l. Achenes straight and flat, not strongly keeled, without pale corky margins: chaff reddish tipped: rays 1.5–3 cm. long . . . . *B. laevis* (L.) BSP.

l. Achenes curved, strongly keeled, with pale corky margins: chaff yellow tipped: rays wanting or at most 1.7 cm. long . . . . *B. cernua* L.

k. Heads campanulate to subhemispherical, erect in anthesis: outer involucral bracts ascending: achenes biconvex, coarsely and deeply striate, not tuberculate . . . . *B. hyperborea* Greene.

j. Summit of achenes not convex and cartilaginous *m*

m. Outer involucral bracts regularly and copiously ciliate: achenes dark brown to black . . . . *B. tripartita* L.

m. Outer involucral bracts smooth-margined or nearly so: achenes light brown to olive *B. comosa* (Gray) Wiegand.

d. Achenes not striate: leaves pinnate, the terminal division usually stalked *n*

n. Outer involucral bracts smooth-margined or nearly so . . . . *B. discoidea* (T. & G.) Britton.

n. Outer involucral bracts regularly and copiously ciliate *o*

o. Outer bracts 10–16; inner bracts ovate-triangular, shorter than the disk . . . . *B. vulgata* Greene.

o. Outer bracts 5–8; inner bracts oblong, equaling the disk . . . . *B. frondosa* L.

c. Awns of the same texture as the body of the achene, sharply triangular in cross-section: outer involucral bracts shorter than the disk . . . . *B. coronata* (L.) Britton.[1]

b. Achenes elliptic-ovate, with scarious crenate margins *p*

p. Outer foliaceous bracts 8–10, smooth or merely ciliate, shorter than the inner . . . . *B. aristosa* (Michx.) Britton.

p. Outer foliaceous bracts 12–20, coarsely hispid, mostly longer than the inner . . . . *B. involucrata* (Nutt.) Britton.

a. Achenes linear, 4-angled, narrowed toward the summit *q*

q. Leaves once pinnate; leaflets finely and evenly serrate. *B. leucantha* Willd.

q. Leaves bipinnatifid *r*

r. Ultimate leaf-segments broadly lanceolate, coarsely serrate . . . . *B. bipinnata* L.

r. Ultimate leaf-segments linear, entire . . . . *B. tenuisecta* Gray.

Graduate School of Arts and Sciences, *Harvard University*.

[1] *B. coronata* (L.) Britton = *B. trichosperma* (Michx.) Britton. Not *B. coronata* (L.) Fisch.

SOME CHANGES IN NOMENCLATURE.

K. M. Wiegand.

In a previous paper[1] the writer proposed some changes in nomenclature found necessary in a study of the flora of Central New York. The following cases have been brought to his attention since that time.

Sagittaria latifolia Willd., var. **obtusa** (Muhl.) comb. nov. *S. obtusa* Muhl. in Willd. Sp. Pl. iv. 409 (1805). *S. variabilis*, var. *obtusa* Engelm. in Gray's Man. ed. 2, 439 (1856). *S. latifolia*, forma *obtusa* Robinson, Rhodora x. 31. (1908).—This is the most distinct of the forms of *S. latifolia* found in New York State. The great variation in foliage in this species is chiefly a response to fluctuations in environment, but in var. *obtusa* the obtuse leaf apex and the generally dioecious flowers as well as the rather definite range suggest a more racial difference.

Armoracia **aquatica** (Eaton) comb. nov. *Cochlearia aquatica* Eaton, Man. ed. 5. 181 (1829). *Nasturtium natans* var. *americanum* Gray, Ann. Lyc. N. Y., iii. 223 (1836). *N. lacustre* Gray, Gen. Ill. i. 132 (1849). *Roripa americana* Britton, Mem. Torr. Bot. cl. v. 169 (1894). *Neobeckia aquatica* Greene, Pittonia iii. 95 (1896). *Radicula aquatica* Robinson, Rhodora x. 32 (1908).—The comprehensive genus *Roripa* or *Radicula* contains units which apparently are as distinct from one another as are many generally recognized genera in the *Cruciferae*. On this basis *Roripa* (Yellow Cresses), *Nasturtium* (Water Cress) and *Armoracia* (Horse-radish) should be treated as separate genera. The present species is evidently congeneric with the horse-radish as shown by the stature, size of flowers, shape of pod, and especially by the dissected submerged leaves. The elongated style and partial or complete absence of the septum in the pod do not seem sufficient to warrant the separation of this species as a separate genus in face of the resemblances just stated. These differences are largely variations in degree only. More essential differences are allowed in *Lepidum*, for instance, where incumbent and accumbent cotyledons occur in the same genus without leading to the division of the genus into two. Variations in length of style occur in *Draba*, *Brassica* and other genera.

[1] Rhodoha xxvi. 1 (1924).

POLYGONUM MUHLENBERGII (Meisn.) Watson, forma NATANS Wiegand, RHODORA xxvi. 3 (1924).—In the original publication of this form a rather serious error must be noted. The type specimen cited was Moscow, Washington [Idaho], *W. C. Muenscher,* no. 129. It appears that the western *P. amphibium* often resembles the above forma *natans* in foliage, and the Moscow specimen should be referred to that species. The two species are fairly distinct in width of spike and color of flowers, and less constantly in glandularity of the peduncles and type of cauline and foliar pubescence. The type of *f. natans* may be restated as: "Pool near Fleming School House, Ithaca, N. Y." *K. M. Wiegand & C. C. Thomas,* no. 2234 (in Cornell Univ. Herb.).

CORNELL UNIVERSITY,
Ithaca, New York.

ASTER PUNICEUS L., var. FIRMUS (Nees) T. & G., forma **rufescens,** n. f., caulibus involucrisque austeris purpureis; foliis supra rubidis infra viridibus; caulibus sparse puberulis praesertim supra.

Stems and involucres dark purplish-red: leaves dark red above, green beneath: stems sparsely puberulent, especially above.—QUEBEC: Cap-Rouge, près du Pont de Québec. Zone atteinte par la marée, 29 août, *M.-Victorin,* no. 15401 (TYPE in Gray Herb. and Herb. University of Montreal).

Brother Victorin tells me that in a large patch of this Aster inundated twice a day by the tide, the leaves were consistently dark red on their upper surfaces.—NORMAN C. FASSETT.

THE NEW ENGLAND-ACADIAN SHORELINE.—Although primarily a scholarly and clearly stated presentation of the physiographic (and geological) history of the coast from New England to the lower St. Lawrence, Professor Douglas Johnson's latest volume[1] is so attractively written, so beautifully illustrated and altogether so authoritative a study of the history of our own coast that all serious students of our flora and its history will wish to have the book at hand. In its interpretations of the history of the coast of eastern America

[1] THE NEW ENGLAND-ACADIAN SHORELINE, by Douglas Johnson. 628 pp. 273 figs. New York. John Wiley & Sons. $8.50 *net.*

it gives due weight to recent studies of the phytogeography of the region; and the detailed analyses of the recent geological history of many sections of the coast will suggest to the field-botanist many important correlations in phytogeography which await careful study. —M. L. F.

The date of the September issue (not yet issued as this goes to press) will be announced later.

Farlow Bot. Lab.

Rhodora

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THE RESTORATION OF ISANTHUS BRACHIATUS TO THE FLORA OF CONNECTICUT.

Jesse F. Smith.

In his interesting and illuminating article on John Pierce Brace in Rhodora for May 1914 (vol. 16, no. 185), Mr. C. A. Weatherby wrote concerning Brace's herbarium and his record of plants growing in Litchfield and vicinity:

"The record which we should most like to verify is that of *Isanthus brachiatus.* The claim of that species to admission to the Connecticut flora rests on Mr. Brace's list and a specimen of Charles Wright's at the Gray Herbarium. The latter is marked as from Wethersfield, but the accuracy of its label is under suspicion. Mr. Brace's single specimen is *Isanthus* without doubt; but it was collected in Ohio by Sullivant. One can hardly base a Connecticut record on such evidence; someone will still have to collect *Isanthus.*"

Quite by accident the fortune of being the "someone" prophetically referred to by Mr. Weatherby has fallen upon the writer. On the 31st of last August three specimens of what proved to be *Isanthus brachiatus* were collected in Suffield, Conn.; but the collector, not realizing the significance of the find, did not take particular note of the locality nor search for other specimens. After the specimens had been verified at the Gray Herbarium a second visit was made to the locality on September 26. This visit resulted in the discovery of a colony covering an area of a square rod. A killing frost, which had occurred the previous night, had not injured the plants and several were found still in bloom.

These plants were growing on the floor of an abandoned quarry, close to the so-called Enfield Canal, which extends along the west bank of the Connecticut river from just below Thompsonville to Windsor Locks. About three miles north of Windsor Locks two

small quarries were opened about one hundred years ago to supply the rock needed in the construction of the canal and the dam across the river. These quarries have been used little, if any, since that time. In the northernmost of these quarries, in soil that is practically nothing but disintegrated shale, produced by the erosion of the exposed and weathered rocks which form the northern and western sides of the quarry, *Isanthus brachiatus* has found a congenial home.

This finding of *Isanthus* at Suffield, twenty-five miles up the Connecticut river from Wethersfield, removes the taint of suspicion from the label on Wright's Wethersfield specimen and furnishes contributory evidence of the authenticity of Brace's record for this plant in Litchfield in 1822.

Suffield School, Suffield, Connecticut.

SPARGANIUM MULTIPEDUNCULATUM IN EASTERN AMERICA.

M. L. Fernald.

When Dr. A. J. Eames and I[1] studied the genus *Sparganium* in 1907, we recognized *S. simplex* Hudson as occurring from Newfoundland to British Columbia, south to Maine, Vermont, Colorado and California, with a poorly understood var. *multipedunculatum* Morong occurring from Mackenzie to Colorado and California. Characteristic sheets of the American plant which was passing in the East as *S. simplex*, in the West as *S. multipedunculatum* (Morong) Rydberg, were referred to the great student of the group, the late Professor Wladislaw Rothert, and they all brought from him such notes as the following:

"*S. affine* Schnitzl. (*S. angustifolium* Michx. of the American authors), typicum; forma robustior, foliis latis," or "Dubious. Intermediate between *S. simplex* Huds. and *S. affine* Schnitzl., nearer to *S. simplex*" or, on a Californian sheet, "Most of the Western specimens are clearly different from the European *S. simplex* Huds., and intermediate between this and *S. affine* Schnitzl. (*S. angustifolium* Michx. of the American authors), with individually different combinations of the characters of both. I have marked them as 'dubious.' Many of these 'dubious' specimens have been determined by Rydberg as *S. multipedunculatum* Rydb. or 'var. multipedunculatum Morong.'

[1] Rhodora, ix. 89 (1907).

It is not quite impossible that they are indeed a separate species, peculiar to the West of North America: but I am not able to find any characters of their own, constantly distinguishing them both from *S. simplex* and from *S. affine;* consequently I am rather inclined to consider them as non-hybrid transition forms between these two species. Most of the specimens do not fit Morong's description of his var. *multipedunculatum.*"

That this intermediate American plant, an extreme specimen of which formed the basis of *S. simplex*, var. *multipedunculatum* Morong, is not satisfactorily referred to the European *S. simplex* is clear. The latter species has the linear-filiform stigmas commonly 2 mm. or more long and the staminate half of the inflorescence with 3–6 mostly remote heads; the "dubious" *S. multipedunculatum* having the thickish stigmas 1–1.8 mm. long and the 2–4 staminate heads approximate. In the latter character and in the form of its stigmas the "dubious" plant is close to *S. angustifolium* Michx. (*S. affine* Schnitzl.) and in my latest treatment[1] of the Sparganiums of northeastern America I treated the eastern material as broad-leaved *S. angustifolium.* During the past summer, however, after repeatedly seeing the latter species, Messrs. Bayard Long, K. M. Wiegand and I collected the broad-leaved plant in brooks at Blanc Sablon, Labrador and in the field it was so unlike *S. angustifolium* that a new study of it has been made. This results in the recognition in eastern America of *S. multipedunculatum,* a species heretofore considered distinctive of western North America. From *S. angustifolium* it at once differs in its coarser habit; its broader and flatter leaves which are scarcely dilated at base and which (seen by transmitted light) have much more remote nerves, larger fruiting heads and longer stigmas. In the East *S. multipedunculatum* occurs from southern Labrador to Lake St. John and south to Sable Island, Nova Scotia, Knox and Franklin Counties, Maine, Cheshire County, New Hampshire, and Orleans County, Vermont. Superficially it sometimes resembles coarse forms of *S. chlorocarpum* Rydberg, but that species differs in its more numerous and scattered staminate heads and in having the summits of the longer-beaked fruits ribbed.

The diagnostic characters of the three species, *S. chlorocarpum, S. angustifolium* and *S. multipedunculatum,* and a citation of eastern specimens of the latter are given below.

[1] Rhodora, xxiv. 31–34 (1922).

Staminate half of inflorescence 2–10 cm. long, of 4–9 mostly scattered heads (if shorter and with fewer heads, the plant very low and with erect lower bracts): fruit distinctly ribbed at summit between the 3 angles; its beak about equaling the body: tips of sepals appressed to the fruit: plants commonly erect and emersed............*S. chlorocarpum.*

Staminate half of inflorescence 1–3 cm. long, of 1–4 (rarely—6) mostly crowded heads: fruit only faintly if at all ribbed between the often obscure angles; its beak much shorter than the body: tips of sepals loosely ascending or spreading: plants commonly aquatic and with long floating leaves and lower bracts.

Leaves rounded on the back, 1.5–4 (rarely—5) mm. wide; the middle and upper ones and the bracts with dilated and subinflated sheathing bases; the strong nerves of the principal ones (seen on under surface) mostly 0.2–0.8 mm. apart: pistillate heads 1–3, in maturity 1.2–2 cm. in diameter: stigmas 0.6–1.5 mm. long............*S. angustifolium.*

Leaves flat and ribbon-like, scarcely dilated or inflated at base, 5–12 mm. wide; the strong nerves of the principal ones 0.8–2 mm. apart: pistillate heads 1–5, in maturity 2–2.5 cm. in diameter: stigmas 1–1.8 mm. long....................................*S. multipedunculatum.*

Sparganium multipedunculatum (Morong) Rydberg, Bull. Torr. Bot. Cl. xxxii. 598 (1905). *S. simplex*, var. *multipedunculatum* Morong, ibid, xv. 79 (1888). *S. simplex* of recent eastern Am. authors, not Huds.—Lakes, ponds and pools, southeastern Labrador to Alaska, south to Newfoundland, Nova Scotia, Maine, New Hampshire, northern Vermont, Colorado and California. The following eastern specimens belong here. Labrador: brooks entering Blanc Sablon River, *Fernald, Wiegand & Long*, no. 27,315. Newfoundland: Virginia Water, St. John's, *Robinson & Schrenk*, no. 200; muddy ponds, Chimney Cove, *Waghorne*, no. 82. Quebec: shallow pool, River Etamamion, Charnay, *St. John*, no. 90,076; embouchure de la rivière Ouiatchouan, Val-Jalbert, Lac Saint-Jean, *Victorin*, no. 15,976; Lake Pratt, Co. Temiscouata, *Victorin*, no. 692. Magdalen Islands: shallow water near the margins of brackish ponds southwest of Étang du Nord village, Grindstone Island, *Fernald, Long & St. John*, nos. 6756 (distributed as *S. angustifolium*, approaching *S. simplex*), 6757; lagune de l'Étang-du-Nord, *Victorin & Rolland*, no 9460. Prince Edward Island: pool bordering a bog, Brackley Point Road, *Fernald, Long & St. John*, no. 6759: border of a fresh pond, back of sand hills, Tracadie, *Fernald & St. John*, no. 10,893 (distributed as *S. chlorocarpum*). Nova Scotia: sandy margin of Pottle's Lake, North Sydney, *Bissell & Linder*, no. 19,670; brackish lake, Sydney Mines, *Bissell & Linder*, no. 19,672: Sable Island, *John Macoun*, no. 22,637. Maine: Pettiquaggamis (Glazier) Lake, August 8, 1893, *Fernald:* Farmington, August 13, 1894, *Fernald:* small pond back of beach, Head Harbor Island, Jonesport, *Cushman & Sanford*, no. 1561; Black Duck Pond, Matinicus, July 13, 1919, *C. A. E. Long.* New Hampshire: margin of Warren Pond, Alstead,

Fernald, no. 553. VERMONT: outlet of Long Pond, Willoughby, July 14, 1896, *G. G. Kennedy;* July 26, 1896, *E. F. Williams.*

GRAY HERBARIUM.

LIMODORUM TUBEROSUM L.

K. K. MACKENZIE.

THE first volume of Gronovius, Flora Virginica, is said to have appeared in 1739. In this work Gronovius was assisted by Linnaeus (Jackson Linnaeus p. 165).

Very fully and carefully described in this work (p. 110) was a plant from Virginia collected by Clayton to which the name *Limodorum* was given. There has never been the slightest question on the part of any botanical author about the identity of the plant so described. It is the plant which has appeared in our manuals of botany either as *Limodorum tuberosum* or *Calopogon pulchellus.*

The description given by Gronovius is as follows:

"*Limodorum*

Helleborine Virginiana bulbosa, flore-atrorubente. Banist. Plukn. Alm. p. 182.

Gladiolo Narbonensi affinis Planta Mariana, floribus minoribus. Pet. Mus. n. 413.

Orchis verna testiculata aquatica, flore pulcherrimo specioso rubro in spicam tenuem disposito, foliis longis angustis. Clayt. n. 76.

Helleborine radice tuberosa, foliis longis angustis, caule nudo, floribus ex rubra pallide purpurascentibus Martyn. Cent. I. T. 50. hujus videtur varietas.

Cal. *nullus, cujus loco Germen.*

Cor. *Petala quinque, ovato-lanceolata, aequalia. Labium inferius constituit Nectarium lineare, longitudine petali longitudinaliter barbatum, apice cordato.*

Stam. *Filamenta vix conspicua. Antherae binae, adnatae corpori lineari arcuato, longitudine corollae, apice appendiculato.*

Pist. *Germen columnare, longitudine corollae, sub receptaculo floris. Stylus filiformis, adnatus corpusculo lineari. Stigma concavum.*

Peric. *Capsula columnaris, trivalvis, angulis dehiscens.*

Sem. *numerosa, scobiforma.*"

In 1740 there also appeared another work with which Linnaeus had a great deal to do. I refer to Royen, Florae Leydensis Prodromus, which is so constantly cited by Linnaeus in his own works as "Roy. lugdb." On page 16 of this work the same plant is again to be found very fully and accurately described.

Linnaeus himself fully described the same plant in various editions of his Genera Plantarum, the second published in 1742 (p. 435); the third published in 1743 (p. 333); the fourth published in 1752 (p. 333); the fifth published in 1754 (p. 407). In all of these his only references are to the original descriptions appearing in Gronovius and Royen.

In 1753 in the second volume of the first edition of the Species Plantarum p. 950 is found the original description of *Limodorum tuberosum* L. This is as follows:

"*LIMODORUM.*

tuberosum. 1. LIMODORUM. Roy. lugdb. 16. Gron. virg. 110. Act. ups. 1740 p. 21.

Helleborine americana, radice tuberosa, foliis longis angustis, caule nudo, floribus ex rubro pallide purpurascentibus. Mart. cent. 50. t. 50.

Habitat in America septentrionali.

Plumierii species americae australis plurimas non vidi."

It will be noted that in the original description of *Limodorum* by Gronovius there is a reference to Martyn's plate 50. The same reference is also given by Royen, and it again appears in the Species Plantarum. Whatever misunderstanding has arisen about the use of the name *Limodorum* has arisen from this reference. The plate in fact illustrates a West Indian orchid, a species of *Bletia.* This species, as illustrated, looks very much like the *Limodorum,* and it is no discredit to Linnaeus that he confused them.

However, it is very plain indeed that what Linnaeus always had primarily in mind, when he used the name *Limodorum,* was the plant described by Gronovius, by Royen, and by himself, from an actual specimen collected by Clayton in Virginia. I do not believe that any one would for a minute argue that merely because a scientist cited a plate from another work when naming and describing a new species from an actual specimen before him that the name given by the scientist should be applied to the plant shown by the plate rather than to the plant actually before the author.

It may be further argued that Linnaeus took his specific name "tuberosum" from Martyn's species. But a reference to the Gronovian description of *Limodorum,* will show that Linnaeus merely selected the most suitable of several available names expressing the same thoughts. Even if this were not so, merely borrowing a name from a descriptive phrase does not, under the circumstances of the

present case, require the name to be used for the plant from which the name was borrowed. It must still be used for the plant actually described.

It is then the only proper thing to do to use the name *Limodorum tuberosum* for the plant of the Eastern United States and it is not proper to use it for the West Indian *Bletia*.

Calopogon pulchellus.

The other name by which our handsome orchid has been known to some botanists is *Calopogon pulchellus* (Salisb.) R. Br. That name goes back to the following description:

"Limodorum.

"Corolla 1-labiata. Anthera 1, Caveae styli dorso inserta, mobilis. Stylus sub anthera 1-labiatus.

"Pulchellum. 1. L. petalis exterioribus recurvulis, interioribus incurvulis: labio erecto, supra basin lateribus reflexo; apice expanso, late cochleaeformi, acuminulato; disco 3-carinato, deinde piloso. L. tuberosum. Linn. Sp. Pl. ed. 2. p. 1345."
Salisbury Prodr. Stirp. 8. 1796.

It will be noted that while Salisbury gives a description, he was really but giving a new name to *Limodorum tuberosum* L. This was one of the "direct and conscious renamings of species already validly named, such as was freely indulged in by Salisbury" to quote the appreciative language of Messrs. Fernald and Weatherby.

In 1805, Willdenow (Sp. Pl. 4: 105) used the name *Limodorum pulchellum* in the genus *Cymbidium* as *C. pulchellum*. He gave no description, merely citing *Limodorum tuberosum* L., Royen, Gronovius, a description by Swartz, Michaux's description of *Limodorum tuberosum* L. and Salisbury's description of *Limodorum pulchellum*.

In 1813 the genus *Calopogon* R. Br. was published (Ait. Hort. Kew (Ed. 2) 5: 204–5). This is as poorly described as can well be imagined. The entire description is "*Calopogon. Brown mss.* Labellum posticum, unguiculatum: lamine barbata. Petala 5 distincta. *Columna* libera. Pollen angulatum." Only one species was given, namely *Calopogon pulchellus*. It is not described at all, but is based solely on *Cymbidium pulchellum* Willd.[1] and a plate of *Limodorum tuberosum* L. in Curtis magazine (pl. 116).

[1] Swartz had previously published the name *Cymbidium pulchellum* based on *Limodorum tuberosum* L. and *Limodorum pulchellum* Salisb. (Nov. Act. Ups. 6: 75; also Schrader Journ. 2: 220. 1799). His work, however, was apparently not known

From the above one will see that the name *Calopogon pulchellus* is directly based on *Limodorum tuberosum.* All of the authors dealing with the two plants (Salisbury, Willdenow and R. Brown) treated them as the same. The name is one arising from Salisbury's habit of renaming plants, so feelingly characterized by Messrs. Fernald and Weatherby. Under the American code of nomenclature the name of our pretty orchid is *Limodorum tuberosum.* Under the Vienna code one is told that one must substitute the very poorly published name *Calopogon* for the older and very carefully described *Limodorum.* This is certainly an excellent illustration of how carelessly that code was prepared. But even under the Vienna code the name of the species is not *Calopogon pulchellus* but is *Calopogon tuberosus* (L.) B.S.P.

Maplewood, New Jersey.

THE ARCTIC VARIETY OF ALOPECURUS AEQUALIS.

M. L. Fernald.

The plant of north temperate regions which passes in America either as *Alopecurus aristulatus* Michx. or as *A. geniculatus,* var. *aristulatus* (Michx.) Torr. has abundant characters to distinguish it from *A. geniculatus* L. of Eurasia, a species locally naturalized in North America. These characters have been clearly set forth by Bicknell[1] and by St. John[2] and, briefly enumerated, are as follows: more delicate habit, glaucous or pale-green color, less geniculate or depressed culms, less inflated sheaths, longer and more slender pale spikes with spikelets only about 2 mm. long, short straight awn about equaling to barely exceeding the glumes and attached near the middle of the lemma, anthers 0.5–1 mm. long, yellowish; the coarser European *A. geniculatus* having, as its name implies, geniculate stems, a full green color, inflated sheaths, coarser and commonly darker spikes with spikelets about 3 mm. long, a long-exserted and twisted awn attached near the base of the lemma, and brown or purple anthers 1.5–2 mm. long.

to Robert Brown, and forms no part of the history of the name *Calopogon pulchellus* as given by Brown. It is, however, the only basis for the erroneous authorship (*Calopogon pulchellus* (Sw.) R. Br.) given in Gray's Manual, 7th Ed., p. 312. It is also most probable that Willdenow had the name of Swartz in mind, although he does not directly say so.

[1] Bicknell, Bull. Torr. Bot. Cl. xxxv. 472 (1908).

[2] St. John, Rhodora, xix. 165 (1917).

Although the specific distinctions of the two plants are now well understood, the correct name for *A. aristulatus* seems to have been missed by American students of the group. In Eurasia, where the species occurs and where it is now generally maintained as distinct from *A. geniculatus* L., it long passed as *A. fulvus* Sm. Engl. Bot. xxi. t. 1467 (1805), but since *A. aristulatus* Michx. Fl. Bor.-Am. i. 43 (1803) antedates Smith's name, Michaux's binomial has been used in America. A still earlier specific name, however, is *A. aequalis* Sob. Fl. Petrop. 16 (1799). Sobolewski described *A. aequalis* as differing from *A. geniculatus* in having "Aristis gluma aequalibus," the most important diagnostic character of *A. aristulatus* (or *A. fulvus*), and for practically a century *A. aequalis* was cited in Eurasian literature as a synonym of *A. fulvus*. Recently, however, with the impulse to more exact application of priority-principles, the name *A. aequalis* has been revived in Europe by such close students of nomenclature as Schinz & Thellung,[1] Britton & Rendle,[2] Druce,[3] Hanbury[4] and Lindman[5] and we should fall in line by accepting for *Alopecurus aristulatus* Michx. (1803) or *A. fulvus* Sm. (1805) the earlier name, A. AEQUALIS Sob. (1799).

During the past summer, on the Straits of Belle Isle, Messrs. Long, Wiegand and I became much interested in an aquatic Alopecurus, which we found in tundra-pools on both the Newfoundland and the Quebec sides of the Straits. In the first region the plant, with its long ribbon-like leaf-blades floating on the water, suggested *Glyceria fluitans* or *G. borealis;* in the second region, the pool had dried away and the repent stems sprawled loosely on the ground. Both plants, although having very short and scarcely or but slightly exserted panicles only 0.7–3.5 cm. long, have the more important technical characters of *A. aequalis:* small spikelets, short awn inserted high upon the lemma and small pale anthers; but they differ at once from it in their lax habit, short and inflated sheaths and included or but slightly exserted short spike. In all these characters they exactly match the Greenland plant which was set off in 1880 as *A. geniculatus,* var. *natans* J. Vahl. The variety was published by Lange from a manuscript description of Vahl's. Under *A. geniculatus* Lange said:

[1] Schinz & Thellung, Bull. Herb. Boiss. 2me sér. vii. 396 (1907); Viertelj. Naturf. Gesells. Zürich, lxvi. 291 (1921).

[2] Britten & Rendle, List Brit. Seed-Pl. and Ferns (1907).

[3] Druce, List Brit. Pl. (1908).

[4] Hanbury *ed.*, Lond. Cat. Brit. Pl. ed. 10 (1908).

[5] Lindman, Svensk Fanerogamfl. 74 (1918).

"Forma groenlandica hujus speciei excellit thyrso valde abbreviato, saepius vix ultra vaginam superiorem exserto, foliis infer. longe fluitantibus. Haec ut varietas *natans* designata est a beat. J. Vahl (mscr. ined.)." [1]

Lange cited seven collections, three of which are represented in the Gray Herbarium. These and material from Iceland perfectly match the specimens secured by us in pools near the Straits of Belle Isle, and later material of the Greenland plant (Disco, August, 1923, *Porsild*) in a less aquatic form is a good match for St. John's plant from Brest on the Labrador Peninsula, St. John's material being of the emersed phase of the plant.

This plant of Iceland, Greenland, northern Newfoundland and eastern Quebec, with the technical characters of *Alopecurus aequalis*, but differing at once from the common plant of more southern latitudes in habit, sheaths and size and degree of exsertion of spike is, then, unquestionably *A. geniculatus* var. *natans* J. Vahl. It is most probable, however, that it was published under the identical name in 1812 from Lapland, Wahlenberg's description under *A. geniculatus* reading:

"β. *natans:* culmo ramoso, foliis natantibus, glumis obtusissimis . . . natat in lacubus sylvarum pasim." [2]

That the Lapland *A. geniculatus*, var. *natans* Wahlenb. and the plant of Greenland (*A. geniculatus* var. *natans* J. Vahl) are identical is indicated by Simmons who, taking them up as *A. aristulatus*, var. *natans* (Wahlenb.) Simmons,[3] stated that "In den Herbarien liegend zahlreich Examplare aus dem nördlichen Schweden und Norwegen vor, ferner auch aus Sibirien und Grönland."

Under the earliest specific name this arctic variety becomes

Alopecurus aequalis Sob., var. **natans** (Wahlenb.), n. comb. *A. geniculatus*, β. *natans* Wahlenb. Fl. Lapp. 22 (1912); also (independently) J. Vahl in Lange, Consp. Fl. Groenl. 156 (1880). *A. aristulatus*, var. *natans* (Wahlenb.) Simmons, Arkiv för Bot. vi. no. 17: 4 (1907). *A. aristulatus*, var. *Merriami* St. John, Vict. Mem. Mus. Mem. 146: 42 (1922) at least in part, perhaps not *A. Howellii*, var. *Merriami* [misspelled *Merrimani*] Beal, Grasses N. A. ii. 278 (1896). Distinguished by lax habit; stems often repent or floating: leaf-sheaths inflated; the upper 1–5 cm. long: spikes 0.7–3.5 cm. long, often purple-tinged; the base included in the sheath or finally exserted 1–5 cm.—Northern Norway and Sweden, Siberia, Iceland, Greenland,

[1] Lange, Consp. Fl. Groenl. 156 (1880).
[2] Wahlenb. Fl. Lapp. 22 (1812).
[3] Simmons, Arkiv. för Bot. vi. no. 17: 4 (1907).

northern Newfoundland and eastern Quebec. The following American specimens are characteristic. GREENLAND: Sarkak, 1870, *Berggren*, July 18, 1871, *T. M. Fries*, August 12, 1921, *A. E. Porsild;* Blavedal, August, 1912, *Th. Porsild;* Brede Dal, S. Disko, August 8, 1923, *A. E. Porsild;* Frederiksdal, August 1, 1889, *Lundstrom*. NEWFOUNDLAND: pool in tundra, Boat Harbor, Straits of Belle Isle, *Fernald, Wiegand & Long*, no. 27,505. QUEBEC: exsiccated pond on tableland west of Blanc Sablon, *Wiegand*, no. 27,506; sandy pond-shore, Anse des Dunes, Brest, *St. John*, no. 90,117.

Contrasted with var. *natans* the more southern form of *A. aequalis* has culms more ascending at least above the sometimes submersed base and usually taller: leaf-sheaths only slightly inflated; the upper 3.5–10 cm. long: spikes 2.5–8 cm. long, usually not purple-tinged and finally long-exserted (0.3–2.3 dm.).

St. John identifies with the Iceland and Greenland material the plant of islands of Bering Sea described by Beal as *A. Howellii*, var. *Merriami*. Such material as the writer has seen, some of Merriam's original collection from St. George Island and several sheets collected by J. M. Macoun on St. Paul Island, seem, however, much stiffer and coarser than var. *natans* and to have less inflated sheaths and longer-exserted spikes. Should they eventually prove to be referable to var. *natans* the latter name, of course, must be maintained for them, having unquestioned priority. Some other specimens identified by St. John with the Iceland and Greenland plant because of a purplish tinge in the spikelets, depart from it in all other characters and seem better left with the large southern extreme of *A. aequalis:* such plants as Bourgeau's from Saskatchewan and Shear's no. 1502 from Colorado. Although the color is a fair secondary character it too often breaks down: Porsild's material from Greenland shows some spikes with purple tinge, some without; the aquatic plant of the Straits of Belle Isle is similarly variable.

GRAY HERBARIUM.

FURTHER CASES OF INCONSTANCY IN COLOR-FORMS.—On my place in Wilton, Conn., is a narrow strip between grape-vines and a path. Being on the north of the vines it is very much shaded and little will grow there. For a number of years *Impatiens biflora* has taken possession. I do not remember the flowers at first, but for some years they have been spotless except for a few tiny dots in the "slipper."

A plant with dotted flowers was a rarity. This year (1925) the flowers are so heavily dotted that they are literally "pink" (a bright pale scarlet), for the dots are so nearly suffused as almost to cover the yellow (or orange). I thought I had found two plants with dotless flowers, but examination proved they were fully dotted up to the throat. We have had a very wet summer, mostly very warm; whether that has had anything to do with the change, I do not know.

I think it was in 1919 that a plant of *Lobelia cardinalis* was brought to me from Redding, Conn. The flowers were white, except that each corolla-lobe was tipped for perhaps one-sixteenth of an inch with pink (not red). The next year the pink extended inward about double the distance. The third year the color reached halfway to the middle. The fourth year the flower was all colored, the outer part nearly to the cardinal red usual in the species, the center only pink. That year a small plant about four feet away, which must have come from the first, blossomed, the natural red. The winter after, both plants died.—Anna E. Carpenter, Wilton, Connecticut.

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NOTEWORTHY RHODE ISLAND PLANTS.

S. N. F. Sanford.

Although a botanist's chief pleasure may come through the discovery of new species, the range extension of well-known plants, and the location of unreported stations, add not a little to his enjoyment, and often prove useful. It seems worth while, therefore, to record a few such plants collected by the writer, especially those from certain towns in Newport County which have not been fully covered by local floras.

Sparganium eurycarpum Engelm. Little Compton. In shallow water of a pond. Infrequent.

Potamogeton bupleuroides Fernald. Newport, Middletown and Little Compton. Ponds, under brackish influence. The discovery of the Little Compton station for this plant tends to confirm Prof. M. L. Fernald's suggestion that the *Potamogeton perfoliatus* L. of early R. I. botanists may have been *P. bupleuroides.* Reported by Olney, 1847, from Little Compton and Providence.

Vallisneria americana Michx. Little Compton. Pond, possibly Olney's (1847) original station. Also recorded from Providence and Barrington. A plant of wide range, but far from common.

Echinocloa Walteri (Pursh) Nash. Middletown, Little Compton and Barrington. Sandy marshes near salt water. Apparently frequent along the coast.

Cenchrus carolinianus Walt. Little Compton. Sandy soil, near ocean. Infrequent.

Glyceria septentrionalis Hitchc. Tiverton. Some of the older Mass. and R. I. records for *Glyceria fluitans* (L.) R. Br. may be this species.

Glyceria acutiflora Torr. Tiverton. Occasional, bog holes in woods. Roots freely at the nodes, forming loosely spreading clumps.

Elymus virginicus L. var. halophilus (Bicknell) Wiegand. Prudence Id. (Portsmouth). Salt marshes. Probably not uncommon in its preferred habitat, and doubtless included in older collections with *Elymus virginicus* L., from which it was separated by Bicknell as *E. halophilus*, but more recently changed, by Wiegand, to a variety of *E. virginicus*.

Cyperus Grayii Torr. Little Compton. Sandy shores, near ocean. Recorded from coastal towns of Mass. and R. I., but apparently the stations are few. Recently reported from Westerly, R. I.

Smilax herbacea L. Warren and Bristol. Frequent rather than common. Individual plants in a colony seldom numerous.

Pogonia verticillata (Willd.) Nutt. Tiverton. Open woods and shaded thickets. Probably not common anywhere in New England, and comparatively rare in Rhode Island.

Glaucium flavum Crantz. Prudence Id. (Portsmouth) and Bristol. In beach shingle, on cliffs, and in waste places, on or near the coast. Also reported from Portsmouth, Little Compton, Conanicut Id., and "Mt. Hope Bay," R. I. Prudence Id. may be Olney's original station. Introduced and local.

Rubus rhodinsulanus Bailey. Prudence Id. (Portsmouth), in Narragansett Bay. Dry, open, sandy pastures, forming circular patches, the runners—often 5 or 6 feet long—extending like spokes from the hub of a wheel.

A new species, recently described by L. H. Bailey in Gentes Herbarum, vi. Rubus. Oct., 1925, pp. 233, 242, 243. Somewhat resembles *Rubus arenicola* Blanchard. May not be confined to this island.

Strophostyles helvola (L.) Britton. Prudence Id. and Barrington. Specimens from Jamestown, Newport Co., have also been seen.

Geranium Robertianum L. Tiverton. Rich soil of wooded hillsides. Infrequent.

Cryptotaenia canadensis (L.) DC. Lincoln. Well within its range, but all stations in southern Mass. and R. I. are worth recording.

Cornus canadensis L. Tiverton. Rocky pasture thicket.

Visited several years in succession. Cautious inquiry gave no indication that the plants were not native, and the wildness of the country and the nature of the people were not conducive to the sentiment of transplantation. On the second visit a competent botanist was taken to confirm the record.

Listed from Portsmouth, R. I., nearly forty years ago.

Hottonia inflata Ell. Tiverton. Stagnant or quiet waters of ponds and streams. Although more than a dozen stations are known in southeastern Mass., the R. I. records for this plant are not numerous.

Samolus floribundus HBK. Bristol. In brackish mud. Notwithstanding the wide and peculiar distribution of this species, the New England stations are comparatively few and scattered.

Limosella subulata Ives. Little Compton. In sandy mud and shallow water of pond, near ocean. Also reported from the town of Narragansett, and from Providence. A rare and local plant and always interesting.

Aster concolor L. South Kingston. Dry, sandy loam of pastures, and on banks of glacial till. Several stations scattered along the South Shore between Wakefield and Westerly. Also recorded from this general region, but farther inland, near Worden's Pond.

A very handsome plant, often with thick, cylindrical clusters of pink-violet flowers changing to deep blue-violet when pressed. The range of this plant—eastern Mass. (including Nantucket), Rhode Island and southward—adds to its interest.

Mikania scandens (L.) Willd. Tiverton. Another plant of wide distribution, but not frequently collected.

Onopordum Acanthium L. Prudence Id.: a small colony in barren pasture. Providence: a large colony, in waste ground, east side of the city. Lincoln: a single, villainous looking shrub, 6 or 7 feet tall and nearly as wide, existed, a few years ago, in this town. Apparently an introduction of rare and local occurrence.

Boston Society of Natural History.

THE IDENTITY OF ERIOPHORUM CALLITRIX.

M. L. Fernald.

One of the most characteristic members of *Eriophorum* § *Vaginata* in northeastern America—from Baffinland and Labrador to Athabasca, south on bogs and in spruce swamps to Newfoundland, Nova Scotia, southern New England, the mountains of Pennsylvania, northern Indiana and Wisconsin—is the Harestail, the densely cespitose species which by early American authors was identified

with *E. caespitosum* Host of Eurasia, by later American botanists was called the Eurasian *E. vaginatum* L. (with which *E. caespitosum* Host is synonymous) and which in 1905[1] I identified with *E. callitrix* Cham., a species described from the Asiatic side of Bering Strait.

That the common plant of northeastern America is not identical with the Eurasian *E. vaginatum* (including *E. caespitosum*) is clear. *E. vaginatum* has the bladeless sheaths of the culm more inflated than in the cespitose plant of eastern America, the oblong flowering spike 1–3 cm. long, the anthers 2–3 mm. long, the achenes narrowly obovoid, and the mature denuded rachis 0.9–1.5 cm. long; the common plant of eastern America having the obovoid to subglobose flowering spike 0.8–1.5 cm. long, the anthers 1–2 mm. long, the achenes broadly obovoid, and the mature denuded rachis 0.6–1 cm. long. In 1905 it was thought that the American plant which had long passed as *E. vaginatum* should be identified with *E. callitrix* Cham. from Bering Strait, this conviction gaining strength from the fact that nothing else was known which so closely matched the description and beautiful figure of Chamisso's species.[2] The name *E. callitrix,* to be sure, had been applied in Europe to the very slender plant now generally known as *E. opacum* (Björnstr.) Fernald[3]; but in recent years it has been excluded from European floras and in America has been used exclusively for the common plant of the northeastern bogs and tundra.

In July, 1925, however, while exploring near the Straits of Belle Isle in northwestern Newfoundland, the writer and his companions found themselves in a region where the *Eriophora* of the section *Vaginata* abound: *E. Scheuchzeri* Hoppe, *E. Chamissonis* C. A. Meyer, *E. Chamissonis,* var. *aquatile* (Norman) Fernald, *E. callitrix* of Fernald and other recent American authors, *E. callitrix,* var. *erubescens* Fernald, *E. opacum* (Björnstr.) Fernald; and a seventh and very distinct plant of wet tundra which in some characters suggested the common plant we have been calling *E. callitrix,* in others *E. opacum,* but clearly quite a distinct species from either of them. Always of very low stature (0.5–2 dm. high) and forming the smallest of tufts (1–6 cm. in diameter), with only 1 to 6 culms, the plant was found to be characteristic nearly the length of the south side of the Straits always in regions where the adjacent dry rock-barrens show by their deep mantle of frost-broken and angular residual debris that the

[1] Fernald, RHODORA, vii. 85, 135 (1905).
[2] Chamisso in C. A. Meyer, Mém. Sav. Etrang. Acad. St. Pétersb. i. 203, t. 2 (1831).
[3] Fernald, l. c. 85 (1905).

area was not much modified by the Pleistocene glaciation. From the common cespitose plant of eastern America which has passed as *E. callitrix* the small plant along the Straits of Belle Isle differs at once in having the inflated sheaths of the culms confined to the base of the plant instead of running to the middle of the culms, the spathe and the scales of the spike uniformly blackish and appressed-ascending instead of pale-margined and divergent or even reflexed in age, the anthers at most 1 mm. long, instead of 1–2 mm., the mature fruiting spike turbinate-obovoid and only 1.5–2.3 cm. high, instead of depressed-globose and 2.5–5 cm. in diameter, and the denuded mature rachis with pits opening obliquely upward instead of opening horizontally. From *E. opacum* the lower plant differs by its coarser and stiffer leaves and culms (the slender and delicate culms of *E. opacum* 3–6.75 dm. high), sheaths restricted to the base of the culm and ampliate upward, the upper one usually with a short blade (the more numerous scattered sheaths of *E. opacum* extending nearly to the summit, scarcely inflated and bladeless), the spathe ovate and ribbed nearly to the margin (the narrower spathe of *E. opacum* with broad ribless margin), the bristles brilliant snow-white (in *E. opacum* sordid) and the achenes ellipsoid-obovoid (in *E. opacum* narrowly cuneate-obovoid).

A review of the genus in the light of this species new to the flora of North America leads to the conclusion that this novel plant of northwestern Newfoundland is the species of St. Lawrence Island, fully described and beautifully illustrated as *E. callitrix* Chamisso. Chamisso's description fits it in every particular as do the details of the plate, both of which have been carefully checked with me by Mr. C. A. Weatherby. So long as Chamisso's species was identified with another plant of northeastern America the clarity of his description and plate was not so apparent. Now, however, his presentation of *E. callitrix* becomes convincing and the species takes its place in the long list[1] of plants which divide their ranges between the region of the Gulf of St. Lawrence and the Bering Sea area, a list greatly augmented by the explorations of the past summer. That *E. callitrix* (true) is, indeed, a very rare and localized plant is apparent from the fact that, in spite of the clear description and illustration of it published in 1831, it should have been known to Meinshausen in 1901

[1] See Fernald: *Persistence of Plants in unglaciated Areas of Boreal America*, Mem. Am. Acad. xv. no. 3 (1925.)

only from the original collection: "Hab.: Auf den St. Laurenz-Inseln (nur von *Mertens* gesammelt und mitgebracht)"[1]; and that the Vega-Expedition, in exploring the Arctic coast of Eurasia, should find it only on St. Lawrence Bay, "spärlich . . . Nur von diesen Theil des arktischen Sibiriens her bekannt."[2] That the species should now be found as a member of the relic flora of western Newfoundland is particularly interesting in view of the presence there of such species as *Cerastium Fischerianum* Seringe of the shore of Bering Sea, *Primula sibirica* Jacq., and particularly of *Senecio resedifolius* Less., the type of which came from St. Lawrence Bay.

The common densely cespitose plant of eastern North America, which long passed as *Eriophorum vaginatum* L. and which I have erroneously identified with *E. callitrix,* seems to have no name and it is here proposed as a new species, and since the present study has materially changed our understanding of the characters of the 1-spiked cotton grasses (*Eriophorum* § *Vaginata*), a new key to and brief synopsis of the eastern American representatives of the section are here given.

Key to the eastern american Species of Eriophorum § Vaginata.

a. Stoloniferous; culms mostly solitary: empty scales at base of spike chiefly 7 or fewer (Subsection Paucivacua)[3] *b.*
  b. Flowering spike broadly obovoid to subglobose, 0.8–1.2 cm. long: scales lead-color to blackish, with only slightly paler narrow margins, ovate-lanceolate to lance-attenuate: anthers 1 mm. long: fruiting spike depressed-globose, 2–2.5 cm. high: bristles bright-white...... *E. Scheuchzeri.*
  b. Flowering spike oblong-cylindric, 1.5–2 cm. long: scales brownish-drab to blackish, with a distinct whitish margin, ovate to ovate-lanceolate, bluntish: anthers 1.5–3 mm. long: fruiting spike obovoid, 2.5–4 cm. long: bristles reddish, cinnamon-color or whitish................ *E. Chamissonis.*
a. Cespitose, not stoloniferous; the culms and basal leaves more or less rigid, in tufts or tussocks: empty scales at the base of the spike usually 10–15 (Subsection Multivacua)[4] *c.*
  c. Spathes and scales of the spike blackish or lead-color, without conspicuous pale margin, appressed-ascending: fruiting spike obovoid, 1.5–2.5 cm. high: achenes 2–2.3 mm. long, 0.5–1.2 mm. broad: pits of the mature de-

[1] Meinshausen: *Die Cyperaceen der Flora Russlands,* Acta Hort. Petrop. xviii. no. 5: 267 (1901).

[2] Kjellman: *Phanerogamenflora an der asiatischen Kuste der Berings-Strasse,* Die Wissenschaftl. Ergebnisse der Vega-Exped. 372 (1883).

[3] Eriophorum § Vaginata Anderss., subsection **Paucivacua**. Section *Paucivacuae* Norman, Christ, Vidensk-Selsk. Forh. (1893), no. 16: 45 (1893).

[4] Eriophorum § Vaginata Andress., subsection **Multivacua.** Section *Multivacuae* Norman l. c. (1893).

nuded rachis opening obliquely upward: plants loosely cespitose, forming tussocks 1–9 cm. in diameter: culms 1–17 *d.*

d. Culms slender, 3–6.75 dm. high: sheaths scattered, usually extending high above the middle of the culm, scarcely inflated, bladeless: spathe lanceolate or lance-ovate, with broad ribless margin: bristles sordid....... *E. opacum.*

d. Culm stout and stiff, 0.6–2.2 dm. high: sheaths mostly confined to the lower half of the culm; the upper ampliate-inflated and usually bearing a short blade: spathe ovate, ribbed nearly to the margin: bristles bright-white.. *E. callitrix.*

c. Spathes and scales lead-colored, with whitish margins, finally divergent or often even reflexed: fruiting spike depressed-globose to broadly obovoid, 2.5–5 cm. in diameter: achenes 2.5–3.5 mm. long, 1.5–2 mm. broad: pits of the mature denuded rachis opening horizontally outward or only slightly ascending: plants forming broad dense tussocks with many culms................ *E. spissum.*

E. Scheuchzeri Hoppe, Bot. Taschenb. 104, App. t. 7 (1800); Fernald, Rhodora, vii. 82 (1905), which see for detailed citations. *E. capitatum* Host. Gram. i. 30, t. 38 (1801). *E. leucocephalum* Bcklr. Flora, xli. 419 (1858).—Arctic regions, south in wet swales and pond-margins to northwestern Newfoundland and southern Alaska.

E. Chamissonis C. A. Meyer in Ledeb. Fl. Alt. i. 70 (1829) as to description for most part, synonymy and citation of Unalaskan specimen, Mém. Sav. Étrang. Acad. St. Pétersb. i. 204, t. 3 (1831), except the Altai plant; Fernald, Rhodora, vii. 83, 133 (1905), which see for detailed citations. *E. intermedium* Cham. ex C. A. Meyer, llcc. (1829, 1831), as synonym, not Bast. *E. vaginatum, β. medium* Laestad. ex Fries, Novit. Mant. ii. 1 (1839), as syn. *E. russeolum* Fries l. c. 2 (1839) as syn. and ibid iii. 170 (1842). *E. Scheuchzeri,* var. *Chamissonis* (C. A. Meyer) F. Nyl. Acta Soc. Sc. Fenn. iii. (1852) and in Anderss. Bot. Not. (1857) 58. *E. medium* Anderss. Bot. Not. (1857) 62. *E. rufescens* Anderss. Bot. Not. (1857) 79. *E. vaginatum,* b. Bcklr. Linnaea, xxxvii. 94 (1871). *E. russeolum,* var. *rufescens* Hartm. Handb. ed. 11: 450 (1879).—Labrador to Alaska, south in wet bogs and margins of pools to central and western Newfoundland, St. Pierre et Miquelon, Nova Scotia, southern New Brunswick, James Bay and Ottawa Valley, Ontario, Lake Huron (*fide* Hooker), Wyoming, Idaho, Washington and Vancouver Island.—The typical form has slender culms 1–5 dm. high and rarely more than 1.5 mm. in diameter, with comparatively short and slender leaves, the bristles ferruginous. The bristles are white in Forma albidum (F. Nyl.) Fernald, Rhodora, xxiii. 131 (1921). Var. *albidum* (F. Nyl.) Fernald, Rhodora, vii. 84 (1905). *E. russeolum,* var. *albidum* F. Nylander, Acta Soc. Sc. Fenn. iii. (1852) and in Anderss. Bot. Not. (1857) 58. *E. russeolum,* var. *candidum* Norm. Ind. Supp. 46 (1864).

Var. **aquatile** (Norman), n. comb. *E. russeolum,* var. *aquatile* Norm. Archiv. Weath. Naturvid. v. 509 (1881). *E. aquatile* Norm.

Christ. Vidensk-Selsk. Forh. (1893) no. 16:43 (1893). *E. Chamissonis*, subsp. *aquatile* (Norm.) Lindb. fil. Svensk Fanerogamfl. 113 (1918).—A very coarse extreme, with culms 4–6 dm. high and 2–4 mm. in diameter at base: basal leaves coarse and elongate, sometimes about equaling the culms: stolons without bladeless sheaths: empty scales at base of spike often more numerous: bristles paler.—The only American material referred here is from Newfoundland: shallow pool at base of Cape Dégrat, Quirpon Island, August 7, 1925, *Fernald & Long*, no. 27,545.

E. opacum (Björnstr.) Fernald, Rhodora, vii. 85 (1905), which see for many citations. *E. vaginatum*, var. *opacum* Björnstr. Grunddr. af Piteå Lappm. Vaxtfys. 35 (1856). *E. callitrix* Anderss. Bot. Not. (1857) 60; Fries, Bot. Not. (1858) 63; Liebm. & Lange, Fl. Dan. Suppl. t. 122 (1874), a beautiful plate with accurate details.—Straits of Belle Isle, Newfoundland to Alaska, south to Hastings County, Ontario, Saskatchewan, southern Alberta and southern British Columbia; northern Eurasia.

Reports of the plant in New England are due to errors of identification.

E. callitrix Cham. in C. A. Meyer, Mém. Sav. Étrang. Acad. St. Pétersb. i. 203, t. 2 (1831).—Known only from the type region, St. Lawrence Bay on the Asiatic side of Bering Strait, and from the south side of the Straits of Belle Isle, northwestern Newfoundland: peaty margins of pools in limestone barrens back of Big Brook, *Fernald & Long*, no. 27,551; borders of pools in tundra back of Big Brook, *Pease & Griscom*, no. 27,552; moist turfy or peaty depressions in limestone barrens, Cook Point, *Fernald & Gilbert*, no. 27,553; boggy tundra, Schooner (or Brandy) Island, *Pease & Long*, no. 27,554; wet peaty depressions in tundra, Boat Harbor, *Fernald, Wiegand & Long*, no. 27,555; borders of depressions in tundra one mile back of Savage Cove, *Fernald, Pease & Long*, no. 27,556.

E. spissum, n. sp., planta densissime arctissime caespitosa, caespite 1–6 dm. diametro; culmis numerosis erectis subrigidis trigonis apice subscabris 1.5–7 dm. altis infra vel rarius supra medium vaginis 1–2 inflatis remotis dispositis; foliis filiformibus trigonis scabris vaginis deinde fibrillosis; spica obovoidea vel subglobosa 0.8–1.5 cm. alta deinde depresso-globosa 2.5–5 cm. diametro; squamis obovatis vel ovato-lanceolatis longe acuminatis nigrescente-cinereis margine pallidis inferioribus divergentibus vel reflexis; antheris 1–2 mm. longis; achaeniis obovoideis 2.5–3.5 mm. longis 1.5–2 mm. latis; setis candidis; foveis rhacheos denudatae plerumque divergentibus.—*E. caespitosum* Pursh, Fl. Am. Sept. i. 57 (1814), not Host. *E. vaginatum* Torr. Fl. 65 (1824) and later Am. auth., not L. *E. callitrix* Fernald, Rhodora, vii. 85 (1905), not Cham.—Bogs, tundra and mossy swamps, Baffinland and Labrador to Athabasca, south to Newfoundland, Nova Scotia, southern New England, mountains of

Pennsylvania, northern Indiana and Wisconsin. The following, selected from an extensive representation, are characteristic. BAFFINLAND: American Harbor, Cumberland Gulf, 1877–78, *Krumlein;* LABRADOR: Kangalaksiorvik Bay, *Owen Bryant,* no. 39; Tub Harbor, *Sornborger,* no. 280; Blanc Sablon, *Fernald & Wiegand,* no. 2734. NEWFOUNDLAND: swales on limestone barrens, Sandy (or Poverty) Cove, July 25, 1925, *Fernald, Long & Gilbert,* no. 27,557 (TYPE in Gray Herb.); Quarry, *Fernald & Wiegand,* no. 4721; Millerton Junction, *Fernald & Wiegand,* no. 4722; Balena, *Wm. Palmer,* no. 1338. QUEBEC: Lagorgendière, *St. John,* no. 90,196; Natashquan, *Victorin & Rolland,* no. 18,138; Tabletop Mts., *Fernald & Smith,* no. 25,604; Mt. Albert, *Fernald & Collins,* no. 173; Knowlton, Brome Co., May 27, 1923, *C. H. Knowlton.* NEW BRUNSWICK: Bass River, Kent Co., 1869, *Fowler.* NOVA SCOTIA: Grand Lake, Sydney, July 5, 1909, *J. R. Churchill;* Yarmouth, *Howe & Lang,* no. 44. MAINE: Fort Kent, *Fernald,* no. 2090; Orono, *Knight,* no. 89; Rumford, May, 1890, *Parlin;* Cutler, July 3, 1902, *Kennedy et al.;* Sargent's Mt., Mt. Desert I., June 16, 1890, *Rand;* Matinicus, *C. A. E. Long,* no. 22. NEW HAMPSHIRE: Colebrook, *Pease,* no. 10,929; Lake of the Clouds, Mt. Washington, *Wm. Boott et al.;* Mt. J. Q. Adams, *Pease,* no. 10,239; Derry, May 10, 1913, *C. F. Batchelder;* top of Mt. Monadnock, *H. D. Thoreau et al.* VERMONT: summit of Mt. Mansfield, *Pringle et al.* MASSACHUSETTS: Tewksbury, *E. Tuckerman et al.;* Chestnut Hill, May 17, 1896, *E. F. Williams;* Canton, *Blake,* no. 56; Provincetown, *Fernald & Long,* no. 18,070; Charlton, May 20, 1899, *Harper;* Granville, *F. C. Seymour,* no. 139; Washington, May 31, 1909, *Hoffmann.* RHODE ISLAND: Glocester, May 19, 1904, *Collins.* CONNECTICUT: Willington, June 13, 1906, *Bissell;* Middlebury, May 14, 1901, *Harger.* NEW YORK: Mt. McIntyre, *House,* no. 9495; Norfolk, *Phelps,* no. 198; Pecksport, *Maxon,* no. 6188; Cortland, *Eames,* no. 3595. PENNSYLVANIA: Pocono Mountain, May 31, 1865, *Traill Green;* Tannersville, May 30, 1902, *Canby.* UNGAVA: Great Whale River, *Low,* no. 63,278. ONTARIO: Mer Bleue, *Victorin,* no. 59; Edmonton, *Jas. White,* no. 11,469. MICHIGAN: Keweenaw Co., *Farwell,* no. 550; Turin, June 4, 1901, *Barlow;* Agricultural College, June 6, 1893, *Hicks & Wheeler.* INDIANA: Garrett, *Deam,* no. 3005. WISCONSIN: Milwaukee, May, 1844, *Lapham.* KEEWATIN: Churchill, *J. M. Macoun,* nos. 79,222, 79,224. ATHABASCA: Island Creek, Peace River, *J. M. Macoun,* no. 59,541.

E. SPISSUM, var. **erubescens** (Fernald), n. comb. *E. callitrix,* var. *erubescens* Fernald, RHODORA, vii. 85 (1905).—Fruiting spikes broadly obovoid, scarcely depressed-globose as in typical *E. spissum;* scales less reflexed at maturity; bristles brown to coppery red: pits of denuded rachis opening obliquely upward.—Newfoundland and adjacent southern Labrador.

The tendency of the pits of the rachis to ascend and the accompanying tendency to less depressed fruiting spikes along with the highly

colored bristles suggest the possible specific distinctness of var. *erubescens*. The achenes, however, seem inseparable from those of typical *E. spissum* although they are sometimes inclined to be more slender. No flowering specimens of var. *erubescens* have been seen and the anthers are not known, the plant being already in full maturity in July when botanists usually visit Newfoundland.

In my earlier treatment the species here called *Eriophorum spissum* was made to include *E. brachyantherum* Trautv. & Meyer in Middend. Reise,—Fl. Ochot. 98 (1856) and also a plant of the Altai which had been distributed by C. A. Meyer as *E. Chamissonis*. The latter plant is, however, as clearly pointed out by Meinshausen, a non-cespitose and stoloniferous species, *E. altaicum* Meinsh.,[1] related to but distinct from *E. Chamissonis* as represented by Chamisso's material. *E. brachyantherum*, likewise, does not belong with the eastern American *E. spissum*, having the scales of the spike appressed-ascending and uniformly blackish and very delicate leaves as long as the culms.[2]

GRAY HERBARIUM.

CLADONIA APODOCARPA; A NEW SPECIES.

C. A. ROBBINS.

IN almost any region there may be found localities quite entirely possessed by a varying intermixture of *Cladonia* species. In Plymouth County, for instance, a typical colony of old abandoned fields is likely to include species such as *subcariosa, pyxidata, chlorophaea* and *strepsilis*. Another species also likely to be found associated and always occurring in a sterile condition locally is *foliacea*.

Excepting the last, the various species forming these colonies are represented by plants in all stages of development from sterile primary squamules to fully evolved forms and hence the attention of the collector will be as often concerned with the thallus of these species as with clusters of plants having more or less fully developed podetia. But in attempting to refer all patches of squamules to the species to which each properly belongs he frequently will meet with a characteristic little plant, represented only by a thallus, which is

[1] Meinsh. l. c. 267 (1901).
[2] See Meinsh. l. c. 269 (1901).

not referable to any of the species composing the colony. The squamules are somewhat similar in shape to those of *Cl. foliacea* var. *alcicornis* (Lightf.) Schaer. but they are grayish, not yellowish, less coriaceous, smoother, thinner, as a rule smaller, and their reaction to caustic potash is quite different. Indeed they present no decided likeness to the primary squamules of any other species. Those of *Cl. turgida* (Ehrh.) Hoffm. have a somewhat similar chemical reaction but they are larger and coarser.

The plant is widely distributed as the stations so far found for it show. It is distinctive and readily recognizable when once acquaintance is made with it. Throughout the Buzzards Bay region it is common to abundant; not only occurring mixed with other species but often forming colonies by itself. In the hill pastures of the White Mountains, or at least in those in the vicinity of Jackson, New Hampshire, it is almost equally common and Dr. S. F. Blake has found it well established in eastern Maryland and eastern Virginia. It should therefore be recognized as a species.

Cladonia apodocarpa sp. nov.; primary squamules medium size to large, the segments broad to oblong with sinuate, entire margins, above ashy-glaucescent, KOH + (yellowish); below white, smooth, KOH + (pale yellow); podetia wanting; apothecia sessile on the surface or margins of the squamules, brown becoming blackish. On sand, sandy loam, more rarely on humus; in old fields and pastures, exposed sandy banks, etc.

Specimens from Wareham, Massachusetts have been deposited in the Farlow Herbarium at Cambridge and in the United States National Museum at Washington, D. C.

Onset, Massachusetts.

EXCURSION TO SOUTHERN VERMONT.

Clarence H. Knowlton.

The New England Botanical Club had a field excursion in southern Vermont, June 19–20 of this year, with headquarters at Wilmington. Only five men attended, Messrs. J. R. Churchill, D. S. Carpenter, F. W. Hunnewell, C. H. Knowlton and H. K. Svenson.

Messrs. Knowlton and Churchill stopped in Vernon and Brattleboro the first day, the latter place furnishing a fine series of rich woods plants. June 20 all visited the towns of Searsburg and Woodford in

the heart of the Green Mts. This area was at first apparently covered with red spruce and hardwood, especially beech and birch, but the forest has been largely depleted by lumbering. *Pyrus americana*, *Amelanchier Bartramiana*, *Sambucus racemosa*, and *Strepiopus amplexifolius* were characteristic plants of the upland, which had an elevation around 2300 feet above the sea.

It was exactly the right season for collecting *Carices*, even the little ones of the *Carex stellulata* group being in perfect condition. Around "Big Pond," so-called, at 2263 feet, was a great abundance of *C. lenticularis* in its prime, also *C. Michauxiana*, enough for all the herbaria of the world. *Lycopodium inundatum* was also abundant here. In the wet shore thicket *Rhododendron nudiflorum* (L.) Torr., var. *roseum* (Lois.) Wiegand[1] was occasional. In another swampy area was *Myrica Gale*, var. *subglabra*, not before reported from Vermont. It grew in abundance, with the typical form.

Lower down at about 1700 feet, in a dry field above the Deerfield river in Searsburg, grew a large quantity of *Vaccinium caespitosum*, previously reported from the region by the late W. H. Blanchard. We were much surprised to find that this species as well as *Amelanchier Bartramiana* were protected by the very inclusive Vermont statute against grasping botanists and greedy nurserymen. Along the river itself was an abundance of *Sanguisorba canadensis*.

Messrs. Hunnewell and Svenson, approaching the region from the west, found *Hydrophyllum virginianum*, *Senecio obovatus*, and other plants characteristic of the Western Vermont calcareous regions.

In order to get a really satisfactory representation of the flora for the Club Herbarium on an excursion of this sort, there should be at least two days for field work, besides the days of arrival and departure. It would be much better, too, to have at least six or eight men in attendance. However, we sampled the flora quite thoroughly along the main road, and added much to our knowledge of southern Vermont.

Hingham, Massachusetts.

[1] Wiegand, Rhodora, xxvi. 4 (1924).

GRIER'S NOTES ON THE FLORA OF LONG ISLAND.[1]

NORMAN TAYLOR.

Two botanical journals have been carrying for some months a series of papers on the flora of Long Island. The value of these is practically *nil* and the publication of them should have been declined. The bibliographical footnote discloses not only shortcomings upon the author's part, but an editorial leniency, or carelessness, matched only by the spelling and imperfect bibliography in the main body of the work. More than two score errors of this sort could be enumerated, were there space or inclination to publish such a list. But the actual statements about the plants of the island challenge attention.

Under the general heading "The Native Flora of the Vicinity of Cold Spring Harbor, L. I., N. Y." four things are incorrect: (1) Many of the plants are not native, as particulars below specify; (2) "Flora" is incorrect since scores of garden or specimen plants on private estates are included: (3) by no means all occur, even by stretching one's notion of the "vicinity" of Cold Spring Harbor, anywhere near this locality: (4) in the text (page 24 of the reprint) the author says that besides other sources he has included "all those species *apt* to be encountered by members of the Laboratory." The italics are mine. To allow such a mixture of ideas to appear under the title "Native Flora" is to put serious students of the flora of the island to the wholly needless burden of checking through

[1] Grier, N. M. Unreported plants from Long Island. I. Pteridophyta and Spermatophyta. Torreya **24:** 71–76. 28 O 1924. [Reprint dated 1994.]

——— Unreported plants from Long Island, N. Y. II. Cryptogams exclusive of Pteridophyta. Torreya **25:** 5–11. Ja–F 1925.

——— Unreported plants from Long Island, N. Y. II. Cryptogams—Part 2. Torreya **25:** 29–35. Mr–Ap 1925.

——— The native flora of the vicinity of Cold Spring Harbor, N. Y. Schizophyta, Myxomycetes, Dinoflagellatae, Bacillariophyta. Am. Midl. Nat. **9:** 245–256. S–N 1924.

——— The native flora of the vicinity of Cold Spring Harbor, N. Y. (Continued). Am. Midl. Nat. **9:** 283–318. Ja 1925.

——— II. Pteridophyta. (Continued). Am. Midl. Nat. **9:** 384–437. My 1925. [Presumably part of the series on Cold Spring Harbor, but there is nothing to indicate this in table of contents, or article heading. Includes, beside Pteridophyta, all flowering plants.]

——— The fossil flora of the vicinity of Cold Spring Harbor, Am. Midl. Nat. **9:** 513–527. Jl 1925. [Includes besides fossil species a section on Insect Galls.]

——— The geology of Long Island with especial reference to the Cold Spring Harbor region and its flora. Am. Midl. Nat. **9:** 531–563. S 1925.

The papers from the American Midland Naturalist, not in their original order, with new page numbers (1–265, one-half blank) and no date were reprinted as "The Native Flora of the Vicinity of Cold Spring Harbor, L. I., New York." Contribution no. 8 from the Biological Laboratory, Cold Spring Harbor, N. Y.

hundreds of such records on the off chance that some wheat may turn up among the chaff.

To particularize with thoroughness would try the patience of the editors and readers of RHODORA, as it has already exhausted that of several workers on the flora and vegetation of Long Island. A few examples will suffice:

"*Vaccinium Vitis-Idaea*. Rocky soil, Bayville, L. I.—N. M. G." Finding that plant on Long Island would be comparable to the recent discovery of *Empetrum nigrum* at Montauk.[1] William C. Ferguson Esq., of Hempstead, an enthusiastic and accurate student of the flora of the island wrote for particulars to Dr. Grier, who referred to a card catalog of species at the laboratory, merely recording the extraordinary "find" as it is printed above. There is no specimen, and the author attached so little importance to reporting this arctic-alpine species from Long Island, that he was vague, to say the least, in attempting to substantiate the record.

"*Thuja occidentalis* . . . White Cedar Swamp, Merrick, L. I." This tree is unknown, outside of cultivation, on Long Island. Merrick is in the town of Hempstead, on the south shore of the island, and separated from the Cold Spring Harbor region by the ecologically different vegetation of the Hempstead Plains. Merrick, Ronkonkoma, and other localities which the author particularizes have no more to do with the vicinity of Cold Spring Harbor than Montauk. Many species should be cut from the list, notably those recorded from the Plains, pine barren bogs, and the pitch pine barrens of the interior of the island,—hardly geographically, and certainly not floristically, the "vicinity" of Cold Spring Harbor.

Perhaps the worst feature of the lists is the inclusion of many species wholly unknown as wild plants, on Long Island and, of course, not native. On the Havemeyer, DeForest, Love, Hodenpyl, and Frank Bailey estates, as well as some others, there have been skillful and successful attempts to cultivate rare, or beautiful, or interesting plants. Upon what theory the author selected some of these for inclusion in his lists of native or unreported plants of Long Island, no one can guess. *Ledum groenlandicum, Sarracenia flava, Trillium grandiflorum, Hexastylis virginica, Sibbaldiopsis* (*Potentilla*) *tridentata, Amorpha fruticosa, Calluna vulgaris, Paulownia tomentosa* and *Centaurea cyanus* indicate a cheerful inclusiveness in the author's point of view as to the material coming within the scope of local flora studies.

For a good many years Mr. Hicks has maintained a large and successful nursery at Westbury, but no one would be more surprised than he to see *Pachysandra procumbens* and *Euonymus atropurpureus* selected from his list of garden plants for inclusion in a native flora of Cold Spring Harbor. Both of these are credited to the nursery,

[1] Taylor, N. & Hill, H. S. The crowberry at Montauk, Long Island. Torreya **24**: 87. 28 O 1924.

which is miles from Cold Spring Harbor, on the Hempstead Plains. The former is also credited to the DeForest place.

Inaccuracy as to plant names and place names characterizes all the lists. Such work naturally stirs suspicion that some records are incorrect, or that plants may have been misidentified.

Millegrana Radiola, for instance, is recorded in Gray's Manual only from "Ditches, Louisburg, Cape Breton," yet it is said to be in "Vicinity, Cold Spring Harbor." No one, not even Jelliffe, who was almost as inclusive as Dr. Grier, has recorded this rare introduced plant from Long Island.

Among the records of Hollick and Jeffrey of fossil plants, Dr. Grier has included scores that are so far reported only from Staten Island, and he cites them so. Why he or the editors admit them into a native flora of Cold Spring Harbor may be known to them. To others their inclusion looks very like useless consumption of printer's ink.

American botanists have lately been accused of an excessive politeness in their criticisms of current botanical literature. Notwithstanding the accusation, the reviewer attempted the desperate expedient suggested by Rose and Stevens in Science n. s. **61**: 656–657. 26 Je 1925. He wrote to one of the editors suggesting a curb,—not a drastic one, but some sort of a curb. Nothing happened except a continuance of the flood. Under such circumstances excessive politeness must make way for reviews like this, the writing of which, while not precisely a pleasure, becomes a duty.

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ERRATA

Page	2,	line	4, *for* Spach., *read* Spach,
"	6,	"	11, for *solonis* read *Solonis*
"	31,	"	13, *for* Dod, *read* Dod.,
"	42,	"	9 from bottom, *for* polleniferous *read* polliniferous
"	49,	"	25, for *leonis* read *Leonis*
"	52,	"	19, for *Phyllococe* read *Phyllodoce*
"	66,	"	11, for *Turriis* read *Turritis*
"	68,	"	8, for *stritca* read *stricta*
"	68,	"	31, for *spicta* read *spicata*
"	81,	"	25, for *Urisema* read *Unisema*
"	117,	"	54, FOR f. *strigosifolia* READ var. *strigosifolia.*
"	158,	"	29, for *terrestre* read *terrestris*
"	171,	"	29, *for* (Pursh) *read* (Adams)
"	176,	"	26, *for* au-dessous *read* au-dessus
"	181,	"	8, for *segata* read *segeta*
"	183,	"	15, for **mississipiense** read **mississippiense**
"	186,	"	4, from bottom, for *Lepidum* read *Lepidium*
"	195,	"	22, *for* was *read* were
"	195,	"	32, *for* lamine *read* lamina

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